

- COLLECTING AND RECEIVING AGRICULTURAL PRODUCE
material for management training in agricultural co-operatives

TRAINER'S MANUAL

international labour office, geneva

© MATCOM 1978-2001

by Malcolm Harper



MATCOM
Material and techniques for cooperatives management
training

The MATCOM Project was launched in 1978 by the International Labour Office, with the financial support of Sweden. In its third phase (1984-1986) MATCOM is financed by Denmark, Finland and Norway.

In collaboration with cooperative organizations and training institutes in all regions of the world, MATCOM designs and produces material for the training of managers of cooperatives and assists in the preparation of adapted versions for use in various countries. MATCOM also provides support for improving the methodology of cooperative training and for the training of trainers.

Publications of the International Labour Office enjoy copyright under Protocol 2 of the Universal Copyright Convention. For reproduction, adaptation or translation, application should be made to ILO Publications, International Labour Office, CH-1211 Geneva 22, Switzerland. The International Labour Office welcomes such applications

Copyright © International Labour Organization

Preface

This training package is one of a number of training packages designed by the ILO - MATCOM Project to assist people who plan or carry out training for the managerial staff of agricultural co-operatives in developing countries.

The training provided under this training package, as well as under the other packages in this series, is based on a thorough analysis of:

- (i) the tasks and functions to be performed in agricultural co-operative societies in developing countries;
- (ii) the common problems and constraints facing the effective performance of these tasks and functions.

The result of this analysis is reflected in the MATCOM "Curriculum Guide for Agricultural Co-operative Management Training". The Guide contains syllabuses for 24 management subjects and it is on these syllabuses that the training packages have been based. The list of subjects is as follows:

1. Co-operative Knowledge
2. Co-operative Law
3. "Co-operative" Management
4. Farming
5. Collecting and Receiving Agricultural Produce
6. Transport Management
7. Storage Management
8. Marketing of Agricultural Produce
9. Supply Management
10. Rural Savings and Credit Schemes
11. Staff Management
12. Office Management and Communications
13. Book-keeping and Accounting
14. Financial Management
15. Cost Accounting
16. Risk Management
17. Statistics
18. Project Preparation and Appraisal
19. Work Planning
20. Rural Sociology
21. Economics
22. Development Economics
23. Export Marketing
24. Public Relations, Member Recruitment and Member Education

For more information on the above training material, please write to:

The MATCOM Project
c/o CO-OP Branch
International Labour Office
CH 1211 Geneva 22
Switzerland.

THE TRAINING PROGRAMME1. Target Group

Target groups for this training programme on "Collecting and Receiving Agricultural Produce" are managers and assistant managers of agricultural co-operative societies with marketing functions.

Co-operative officers or extension staff supporting the above target groups could also benefit from the programme.

2. Aim

The aim of the programme is to train participants to organise and manage the collecting and receiving of agricultural produce. In particular, the programme will enable trainees:

- to describe a collecting and receiving system as a whole and to identify the critical stages and operations within it;
- to identify the alternative ways of organising each stage of a collecting and receiving system;
- to calculate the total cost of alternative collection systems;
- to determine the most economical number and location of collection points for a given crop;
- to design, to staff and physically to lay out an effective crop reception system;
- to measure the trade offs involved in crop collection problems and to design optimum solutions;
- to schedule the collection of crops in the most efficient ways;
- to convey information to members about collection arrangements;
- to design and operate effective systems for the delivery, recovery and payment of temporary packing materials;
- to minimise members' waiting time at reception centres;
- to explain the necessity for crop grading and to select appropriate methods for grading their members' produce;

- to anticipate attempts to defraud members or the society, and to close the loopholes that make such attempts possible;
- to design and operate simple, rapid and secure systems for calculating amounts due and making appropriate entries or payments for members' credit;
- to design, install and manage effective systems for recording the results of receiving and grading operations;
- to apply what they have learned to a range of collecting and receiving problems, and to identify and forestall particular disputes and disagreements between management, the society and its members;
- to apply what they have learned to the particular situations in their own societies.

The programme as described in this manual can be used for a special course on collecting and receiving produce, or it can be incorporated in the curriculum for a more comprehensive management training programme.

3. Duration

The complete programme, as described in this manual, consists of 19 learning sessions. Session times vary from 1 to 3 hours. The total programme will take approximately 40 - 45 hours, or between 7 and 8 days, depending on the qualifications and experience of the trainees. A timetable should be prepared accordingly.

4. Training Approach and Methods

The programme is based on the assumptions that training is expensive and that money for co-operative management training is scarce. Therefore, it looks upon training as an investment, and unless the training yields results, the return on the money invested in it will be nil.

On their return home from the training programme, the trainees should therefore be able to show concrete results of improved management. In order to prepare and equip the trainee to achieve this, the programme has adopted a highly active learning approach through the use of "participative" learning methods and a built-in action commitment.

Trainees will not learn about their duties in a general and passive way. Their day-to-day management problems have, as much as possible, been translated into realistic case-studies, role-plays and other problem solving exercises. Trainees (working mostly in groups) will learn by solving these problems as in real life with the necessary assistance and guidance from the trainer, who will act more as a "facilitator" of learning than as a lecturer.

The built-in action commitment at the end of the programme will give each trainee the opportunity of using the knowledge and expertise of his colleagues in the training programme to find a concrete and acceptable solution to a specific problem he is faced with a solution to which the trainee will commit himself for implementation.

5. Structure

The programme is divided into nineteen topics:

1. Introduction
2. The Collecting and Receiving System
3. Management Alternatives
4. The Cost of Collection
5. The Number and Location of Collection Points
6. Optimising Management Decisions
7. Transport Scheduling
8. Informing Members about Collection Systems
9. Designing the Communication
10. Bag Systems
11. Designing the Reception System
12. Queueing
13. Sampling
14. The Grading of Crops
15. Deception and Prevention
16. Calculations and Payments
17. Recording Procedures
18. Disputes and Decisions
19. Action Programme and Commitment

Each topic above is covered by a session in this package. The following material is provided for each session:

- a session guide for the trainer (yellow pages), giving the objective of the session, an estimate of the time needed and a comprehensive "plan" for the session, including instructions on how to conduct the session;
- handouts (white pages) of all case-studies, role-play briefs, etc., to be reproduced for distribution to the trainees.

6. Adapting the Programme

Before "using" the programme in a real training situation, it may be necessary to adapt it.

Read through the programme and decide whether:

- the programme can be run as it is;
- only certain topics or sessions should be used;
- new topics and sessions should be added.

Your decision will depend on the training needs of your trainees and the means you have at your disposal.

Carefully read through the sessions you have decided to use. Check the subject matter in both the session guides and the handouts. Modify them where possible to include local currencies, names, crops and so on. Such adaptation will help trainees to identify themselves more easily with the people and the situations described in the handouts, and will considerably increase the impact and effectiveness of the training programme.

In the event of substantial adaptation, it is better to retype the page completely.

Minor adaptations (currency, one sentence or paragraph) can be corrected on the original supplied in this binder.

7. Preparing Yourself

Some trainers may feel that material of this sort means that they need only spend a few minutes preparing for each session. This is not the case.

You should carefully study each session guide and prepare a detailed lesson plan based on the content and sequence suggested in the guide, and on the adaptation which you may find necessary.

You should work through all calculations, so that you can explain them to the trainees.

You should obtain and study all necessary local forms, statistics or other material so that you can incorporate them in the session where they are suggested.

8. Preparing the Training Material

Handouts constitute an important part of the training material used in the programme. They can be reproduced from the original handouts supplied in the ringbinder, after the necessary adaptation has been made (see "Adapting the Programme"). Reproduction may be done using whatever method is available: stencil, offset printing, photocopy, or other.

The only item of training equipment which is absolutely essential is the chalkboard.

Trainees should be informed in advance to bring any documentation from their society pertaining to the collection and receiving of produce, such as:

- reception documents (forms used for delivery, grading, payment, etc.);
- examples of information to the members about collection arrangements;
- example of transport schedules;
- quality standard schedules, which are used as a basis for grading the produce received from members;
- cost figures related to operations of collection centres and transports.

The Pre-course Questionnaire should be sent to trainees in advance. Trainees should be asked to complete it and hand it in at the beginning of the training programme.

9. Follow-up and Evaluation

It is recommended that the instructor or other resource persons arrange to contact the trainees after six months in order to see how well they are doing with implementing their "action commitments". The course - not the trainees - should be evaluated by the success which trainees have had in the implementation of their commitments.

TABLE OF CONTENTS

TOPIC/SESSION 1	INTRODUCTION
TOPIC/SESSION 2	THE COLLECTING AND RECEIVING SYSTEM
TOPIC/SESSION 3	MANAGEMENT ALTERNATIVES
TOPIC/SESSION 4	THE COST OF COLLECTION
TOPIC/SESSION 5	THE NUMBER AND LOCATION OF COLLECTION POINTS
TOPIC/SESSION 6	OPTIMISING MANAGEMENT DECISIONS
TOPIC/SESSION 7	TRANSPORT SCHEDULING
TOPIC/SESSION 8	INFORMING MEMBERS
TOPIC/SESSION 9	DESIGNING THE COMMUNICATION
TOPIC/SESSION 10	BAG SYSTEMS
TOPIC/SESSION 11	DESIGNING THE RECEPTION SYSTEM
TOPIC/SESSION 12	QUEUEING
TOPIC/SESSION 13	SAMPLING
TOPIC/SESSION 14	GRADING
TOPIC/SESSION 15	DECEPTION AND PREVENTION
TOPIC/SESSION 16	CALCULATIONS AND PAYMENTS
TOPIC/SESSION 17	RECORDING PROCEDURES
TOPIC/SESSION 18	DISPUTES AND DECISIONS
TOPIC/SESSION 19	ACTION PROGRAMME AND COMMITMENT

topic

1

introduction

SESSION 1

INTRODUCTION

Objective : To demonstrate the importance of effective systems for collecting and receiving members' produce in a co-operative society.

Time : One to two hours.

Material : Completed pre-course questionnaire, timetable and list of participants.

Session Guide :

- 1) If a prominent visitor is to open the programme, he or she should be asked to stress that the purchase of members' crops is by far the most important contact between the management and the members of a co-operative society. Some examples should be given of problems or failures that have arisen through poor management of collecting, receiving and buying of the produce. The speaker should also stress that people in the trainees' position can make a major contribution in this area; their ability to organise effective collecting and receiving systems is a prerequisite for success.
- 2) Ensure that any administrative problems are dealt with. Matters of accommodation, payment of expenses, transport, rooms for private study and any other points of information should be settled now.
- 3) Point out that a training course such as this is an investment. Attempt to estimate its total cost (including trainees' salaries while in training). Ask trainees to suggest how they might use this sum of money if it was available to them to improve the activities in their societies. They may mention investment in equipment, maintenance of buildings, transport or something else. Point out that unless the value of the benefit to the members from this course exceeds the cost of the course,

the money would have been better spent as suggested. Trainees should therefore continually relate what they are learning to their own jobs. If it appears irrelevant, mistaken or they do not understand how to use it, they must say so and the course will be changed accordingly.

- 4) Go briefly through the timetable and stress that trainees will be required to contribute and not merely to listen: people learn not by sitting and listening but by participating and doing things themselves.
- 5) Ask each trainee to summarise his prior training and experience, and to state what he hopes to gain from attending this course. Refer to the pre-course questionnaire if necessary. Stress that everyone brings something to the course and that the total experience in the group as a whole is substantial. While trainers and the material will provide ideas and guidance about techniques and a structure to the course, a major input must come from the trainees.

Attempt to classify trainees' objectives and experience on the board: identify the special expertise or experience that each trainee brings to the course, emphasising the point that the group as a whole is an extremely powerful source of expertise and experience.

- 6) Tell trainees that at the end of the course everyone of them, individually, will be expected to produce and commit himself to an action plan which will include:
 - A statement of a problem in his society, related to the collecting and receiving of produce.
 - A brief description of the way in which he proposes to solve this problem.
 - Ideas on how he will "sell" this solution to his superior and/or subordinate staff, and to the committee and members if necessary.
 - A specific description of exactly what the trainee expects to have achieved by a certain specified date (within 6 months or 1 year from the end of the course).

Tell the trainees that the instructors intend to contact them after this specified period to assess how successful they have been in implementing their plans; the course, rather than they themselves will be evaluated.

Pre-Course Questionnaire

Name:

Society:

Job Title:

Brief description of your responsibilities:

.....
.....
.....

What parts of your job do you enjoy the most?

.....
.....
.....

What parts of your job do you find the most difficult?

.....
.....
.....

Please complete the following sentence:

As a result of attending the course on Collecting and Receiving Agricultural Produce, I hope that I shall be able to

.....
.....
.....

topic

2

**the collecting
and receiving system**

SESSION 2THE COLLECTING AND RECEIVING SYSTEM

Objective: To enable trainees to describe a collecting and receiving system as a whole and to identify the critical stages and operations within it.

Time: Two to three hours.

Material: Micro case studies "The Delta Dairy Co-operative".

Session Guide:

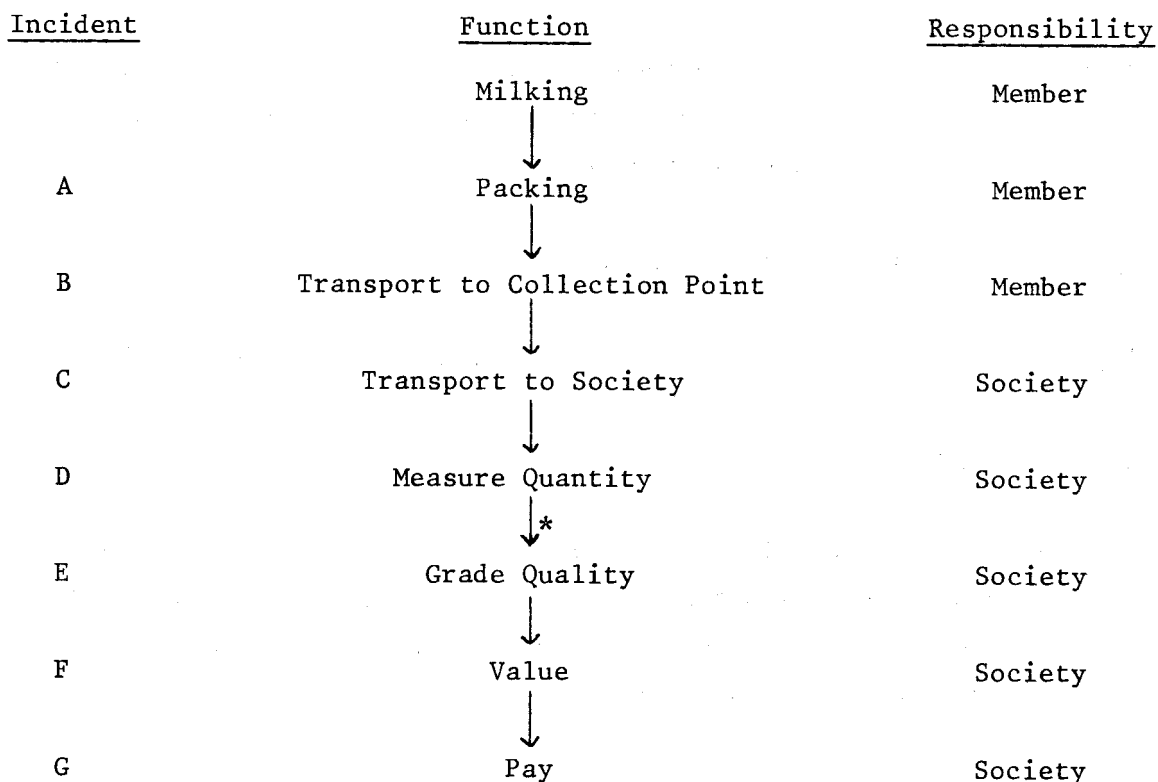
- 1) Ask trainees individually to write down briefly what they believe to be the single most important source of disagreements between their members and their societies. When they have done this ask each trainee to read out what he or she has written.
- 2) As trainees read out their suggestions, classify them on the chalkboard/OHP under appropriate headings such as loans, surplus distribution, low prices, transport, grading or collection.

Show that the majority relate directly to the society's purchases of produce from members. Stress that the actual transaction by which members give up ownership and physical control of their crops to the society is by far the most critical contact between members and their society.

Disagreements over staff appointments, committee membership or other aspects are usually symptoms of dissatisfaction with the single transaction which most vitally affects their livelihood.

- 3) Distribute the set of micro cases. Allow trainees up to 30 minutes to read them and to prepare notes on their answers to the assignment.

When they have finished display a diagram as below of the milk marketing system of the Delta Dairy Farmers' Society, and ask trainees to identify the point at which each incident has occurred, and to suggest what improvement might be made to prevent such incidents.



* Transfer Point

4) Indicate the "location" of the incidents as shown above. Elicit suggestions for improvements such as the following:

- A It should be clearly understood that members are responsible for ensuring the cleanliness of containers, even if these are provided by the Society. If there is enough water for the cows to drink there is enough for the churns to be washed.
- B The Society should encourage members to help one another on an informal basis. It would be better for Busie to pay someone to carry her milk than to waste it.
- C Electricity failures are not unexpected. The Society should construct simple shades or should spray churns with water to keep them cool. It

should also be clearly understood at which stage the milk ceases to be the responsibility of the member. If possible, milk should be weighed when it is collected, so that the Society is fully responsible for its condition thereafter.

- D As above, milk should if possible be weighed at the collection point. In any case, allowance must be made for the weight of the container, and the procedure should be clearly explained and understood by the Checkweighman and the members.
- E Milk should be graded, at least on an occasional random sample basis, before it is mixed with other members' production.
- F National announcements should be co-ordinated with the requirements of individual societies, and the Society should maintain regular communication with individual members.
- G All arrangements for payment and loan deductions should be clearly agreed in writing, and carefully explained to illiterate members to avoid misunderstanding.
- 5) Divide trainees into groups and identify a number of crops which are produced and sold locally and are familiar to trainees. Ask each group to produce a similar diagram for up to four more crops. Depending on the number of groups and of crops, each group may have a different set or the same set of crops. Attempt to make up sets of crops which involve different collecting and receiving systems.
- 6) Allow up to 30 minutes for completion of this exercise. Reconvene the trainees and ask each group to present its diagrams. If more than one group has dealt with the same crop, discuss any differences between the diagrams. Do not spend time on different uses of words. Stress the importance of identifying every stage, and discuss any significant differences.

The details of their diagrams will depend on the crops and local systems, but typical examples might be as follows:

Sugar Cane

<u>Function</u>	<u>Responsibility</u>
Harvest	Society
↓*	
Transport to Collection and Processing Point	Society
↓	
Weighing	Society
↓	
Processing	Society
↓	
Grading	Society
↓	
Valuing	Society
↓	
Payment	Society

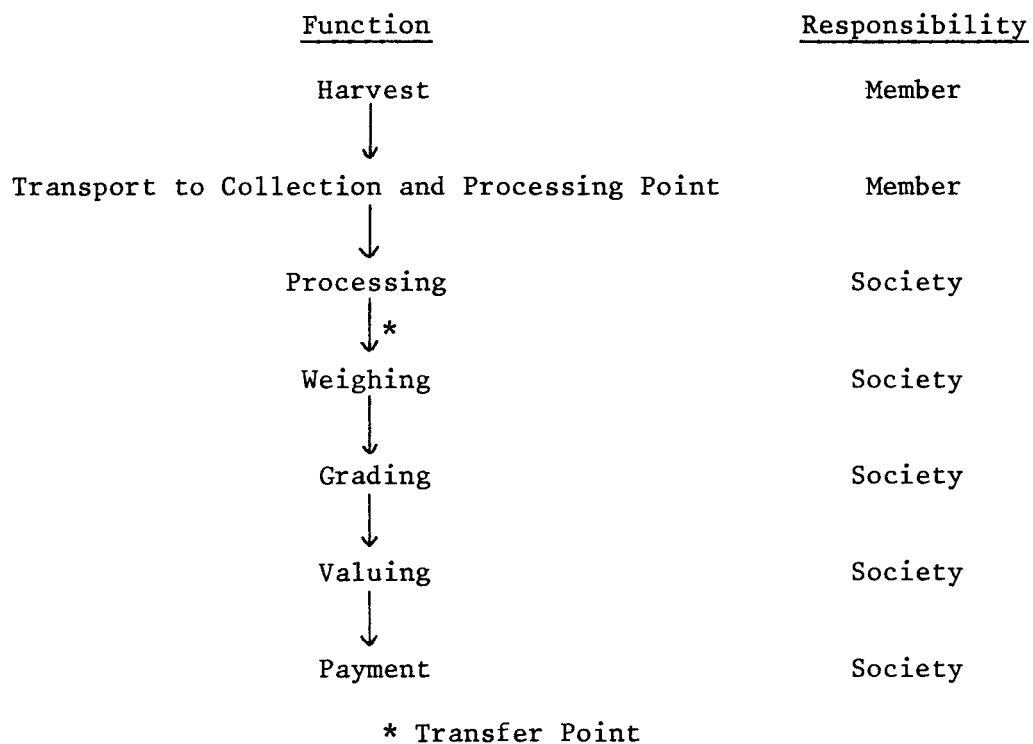
* Transfer Point

Pyrethrum

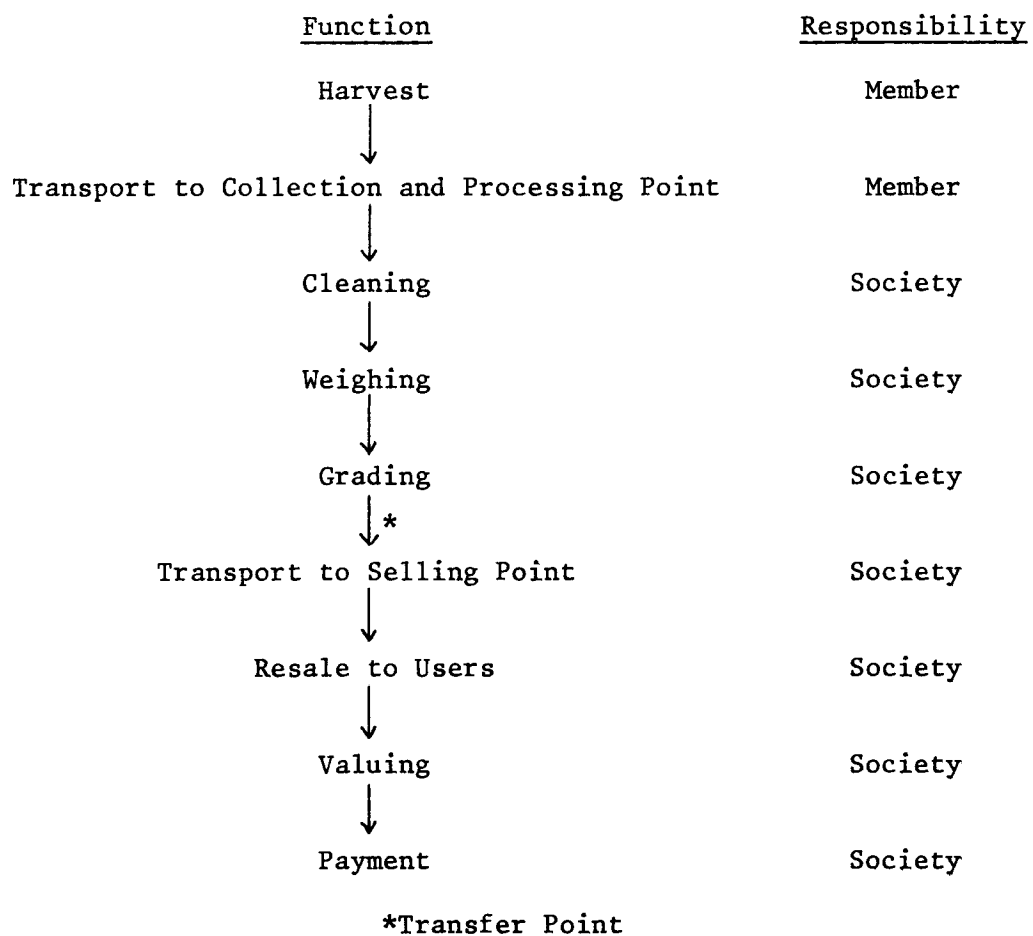
<u>Function</u>	<u>Responsibility</u>
Harvest	Member
↓	
Transport to Collection and Processing Point	Member
↓	
Weighing	Society
↓*	
Processing	Society
↓	
Grading	Society
↓	
Valuing	Society
↓	
Payment	Society

* Transfer Point

Paddy



Fresh Vegetables



7) Ask trainees to suggest from their own experience further examples of disagreement in addition to the types described in the micro cases. Identify the location of these disagreements on the diagrams.

Examples might include:

- Produce not collected because members not properly informed about collection times.
- Disputes over responsibility for unloading produce at collection point.
- Failure to agree value to be credited for returned sacks or crates.
- Disappointed member accuses grading staff of being bribed by members whose crops receive higher grades.
- Members demand that a higher proportion of the final price should be paid on receipt of produce.

Stress that these and other problems can be minimised by:

- Correct design of collecting and receiving systems.
- Good management of systems as designed.
- Efficient communication between the society and its members.

Subsequent sessions should enable trainees to improve their performance in all these ways.

The Delta Dairy Co-operative

Read the following seven micro case studies about members of the Delta Society and complete the assignment given at the end.

A: Absolum's Anger

Absolum's family depended entirely on his income from the milk produced from his ten cattle. The Delta Society paid members a good price, and their pick-up van always came on time to the stand Absolum had built at the end of the track to his farm. On three days during the last month, however, the Society had refused to accept his milk. They claimed that it was dirty, but Absolum was sure that they had mistaken another member's churn for his. Water was very scarce on his farm. He had occasionally complained that the empty churns were not properly cleaned when he received them back from the dairy, but he said he could not possibly clean them himself because of the inadequate water supply.

B: Busie's Burden

Busie's husband earned only a little money from time to time for odd jobs, but he spent most of it on beer. She relied on regular sales of milk from her cow to pay for the children's school fees. During the rains the grass was green and fresh, and her cow was very productive. The Delta Society's pick-up could not cross the river to her farm, however, and she was too busy getting the children off to school in the other direction to be able to walk two kilometers to where the pick-up was able to come. Her children could only drink a certain amount of milk, and the rest was wasted.

C: Carlo's Conundrum

Carlo was furious when his milk was rejected because it was sour. He always kept it cool, and cleaned the churns thoroughly, and he had made sure that the stand he built for his churn was well shaded. He went to the Delta Dairy

himself one day and found the answer. He estimated that the pick-up should have reached the dairy by 9 a.m., but at 11 a.m. he saw his six churns standing among others in the hot sun, waiting to be emptied. He at once complained but the Supervisor pointed out that the electricity had failed as it so often did. There was no other place to put the churns and the dairy's equipment could not start to run until the power came on again.

D: David's Dilemma

David could not understand why his milk money had not doubled when his second lot of four heifers calved and started to produce milk. He knew that they were giving as much or more milk as his four older animals. He now sent a full churn every day instead of half a churn. When he complained at the dairy, the Checkweighman looked up the records and showed that David's full churns only weighed about 80% more than the half full churns, so that payment had only increased in proportion. David still did not understand.

E: Eije's Efforts

Eije wondered whether it was worth trying to produce the best quality milk. Visitors from all over the world came to see his farm, but he still only received the same price per litre as everyone else in the Society. The Secretary of the Delta Society admitted that Eije's milk had a higher butter-fat content than anyones, and he did not deny that some members even added water to their milk from time to time. The Society could only grade the milk after it had been poured into the bulk receiving tank, however, so how could they distinguish between Eije's and anyone else's milk?

E: Farah's Fury

Farah expected a 10% increase in her milk cheque, but it was the same as last month. She burst into the Society's office, waving the cheque and a copy of the newspaper announcing the 10% increase authorised by the Ministry of Agriculture. The Secretary tried to point out that the Committee had agreed that the Delta Society should pay the increase as from the beginning of next

month, since the announcement had been made on the first day of this month and the Society was unable to change the records in time. In any case, he pointed out, Farah would obtain her due share of the larger surplus from the Society at the end of the year.

G: Gurung's Grief

Gurung knew that he still owed the Delta Society \$100 for the iron sheeting he had bought to build his new barn, but he had always said he would repay this at the end of the year when he had sold two of his older cows. Why had the Delta Society reduced his monthly milk payment by \$10, when he needed every cent of his regular income to pay for his family's living expenses? The Secretary pointed out that all loans were repaid by regular monthly deductions, but Gurung was sure that he had only agreed to pay at the end of the year.

Assignment :

Each of these seven case studies describes a problem arising at a certain stage in the collecting and receiving operation of the Delta Dairy Farmers' Society. Identify the particular stage where the problem has arisen and decide what changes might be made to prevent such problems arising in the future.

topic

3

management alternatives

SESSION 3

MANAGEMENT ALTERNATIVES

Objective: To enable trainees to identify the alternative ways of organising each stage of a collecting and receiving system, to determine the factors affecting this choice and to select the most appropriate methods for a given set of circumstances.

Time: Two to three hours.

Material: Handouts 1, 2 and 3: "Management alternatives".

Session Guide:

- 1) Ask trainees to imagine that they are to set up a completely new collecting and receiving system. They should identify the factors which will affect the design of the system, under the headings of the crop, the members and the facilities. Elicit the following factors, among others:

The Crop:

- Is it perishable or long lasting? (e.g. tea or potatoes)
- Is it delicate or tough? (e.g. flowers or cassava)
- Is it low or high in value per kilo? (e.g. strawberries or cabbage)
- Does its value vary greatly or not at all according to its grade? (e.g. wheat or green beans)
- Is it harvested only in particular seasons or throughout the year? (e.g. maize or pyrethrum)

The Members :

- Are they well informed or ignorant?
- Are they in need of immediate cash or can they wait for payment?
- Do they owe money to the society or are they free of debt?
- Are they widely scattered or concentrated in one area?

Facilities :

- Can members' farms be reached easily by wheeled vehicles or not?
- Are there effective telephone and mail services between members and the society or not?
- Do farmers have alternative outlets for their crops or is the society the only market available?

An agreed list, similar to the above, should be summarised on the chalkboard/OHP and noted down by trainees.

- 2) Ask trainees to suggest what decisions must be made when designing a collection and receiving system. Elicit a list of decisions, which should cover the following issues at least:

- Should the society collect members' produce or should they transport their own crops to a collection centre?
- Should the society collect according to a regular schedule or on request?
- Should the society provide any packaging necessary for transport from the farm to collection points or should members provide their own?
- Should the collection centre be open to receive crops throughout working hours, or more, or only at rather restricted times?
- Should crops be graded in members' presence or not?
- Should members be paid in cash at the time of delivery or should the amount be entered as a credit on their account with the society?

- 3) Divide the trainees into groups not exceeding five members. Distribute Handout 1 and allow up to 45 minutes for the groups to complete the assignment.
- 4) Reconvene the trainees and ask one group to present their conclusions with regard to the first aspect - "crop durable or perishable". They should report how all the decisions listed across the top of the two pages (regarding transport, collection, packaging, etc.) are affected by this aspect. Ask the other groups to comment and agree with the class on a common conclusion which should be noted on the chalkboard or flipchart.

Ask another group for their conclusions regarding the second aspect - "crop robust or delicate" - and go through all the items in the same way.

The conclusions will of course depend on opinion and experience but a reasonable set of conclusions might be as shown on the following two pages.

- 5) Distribute Handout 2 to all trainees. Ask them individually to fill in answers to the questions with reference to a given crop (choose the most common crop marketed by the co-operatives in the region). After about 5 minutes ask some trainees to present their conclusions. Their answers will of course depend on crop and local methods, but conclusions for sugar cane and beef cattle might read as follows:

	Sugar Cane	Beef Cattle
<u>Crop</u>		
Perishable	Yes	No
Delicate	No	Yes
High Value	No	Yes
Value varies with grade	No	Yes
Seasonal Harvest	Yes	No
Members and Facilities	(Answers will depend on local conditions)	

Factor	Transport		Collection		Packaging	
	Members to transport	Society to transport	Collect on request	Collect on schedule	Members provide packaging	Society provide packaging
CROP:						
Durable	X		X			
Perishable		X		X		
Robust	X				X	
Delicate		X				X
Low value		X		X		
High value	X		X			
Price varies with grade						
Price fixed						
Seasonal harvest		X	X			
Continuous harvest	X			X		
MEMBERS:						
Well informed					X	
Ignorant						X
Urgently need cash						
Not in urgent need						
Members indebted						
Not in debt to Society						
Members scattered	X				X	
Concentrated						
FACILITIES:						
Bad roads	X					
Good roads		X				
Good communications		X	X			X
Poor communications	X			X	X	
Alternative outlets	X				X	
No alternative		X				X

Factor	Opening hours		Grading		Payment	
	Centre open for short periods	Centre open all day	Members not observe grading	Members observe grading	Pay cash on delivery	Pay by cheque or account entry
CROP:						
Durable	X					
Perishable		X				
Robust	X					
Delicate		X				
Low value	X		X		X	
High value		X		X		X
Price varies with grade				X		
Price fixed			X			
Seasonal harvest		X				
Continuous harvest	X					
MEMBERS:						
Well informed			X			X
Ignorant				X	X	
Urgently need cash					X	
Not in urgent need						X
Members indebted						X
Not in debt to Society					X	
Members scattered		X	X		X	
Concentrated	X			X		X
FACILITIES:						
Bad roads		X				
Good roads	X					
Good communications	X					X
Poor communications		X			X	
Alternative outlets	X					X
No alternative		X			X	

- 6) Distribute Handout 3 to all trainees. Go through the form and ask trainees to fill in the answers with regard to the system used in their own co-operatives for collecting and receiving produce (the same crop as dealt with under 5) above). Display the answers of the majority on a flipchart or OHP.

- 7) The actual collecting and receiving system used in trainees' own co-operatives is now described on the flipchart/OHP (answers to Handout 3). Ask trainees if an "ideal" system is different.

Remind trainees that the "ideal" system can be derived from the conclusions produced in answers to Handouts 1 and 2, and determine through a discussion the "ideal" management decisions.

Compare the ideal system with the actual system described in answers to Handout 3. Some differences may arise from special circumstances, or trainees may modify their answers to Handout 1. Isolate and discuss any features of the system which are not consistent with the ideal, and for which there is no good explanation. Ask any trainees who are responsible for designing or operating any aspects of the system whether a change of the sort suggested by this analysis would be useful:

- Would it be feasible?
- Would it be economic?
- Why has the change not been made before?
- What prevents that individual trainee from introducing the change on his return to his job?

Discuss ways in which individuals at trainees' level in societies can introduce changes, and stress that an organisation is no more than the people in it. Anyone must take responsibility for introducing change in whatever ways are open to him or her.

Handout 1 - Management Alternatives

On the attached forms you will find - down the left-hand side - some aspects which are important in designing a collecting and receiving system, and - across the top - the major decisions that have to be made.

You are required to consider all the aspects in the left-hand column, to discuss if these aspects affect decisions about transport, collecting, packaging, opening hours, grading and payment, and to fill in the forms in accordance with your opinion.

One example has been given. It shows where you should put an 'T' if you believe that durable crops should be transported by members, and perishable ones by the Society. In the same way you should put an 'T' in other boxes when you believe that the particular aspects of the crop, the members or the facilities listed in the left-hand column should affect the corresponding decision about the system. If you believe that a particular aspect has no bearing on the corresponding decision about the system, leave that box empty.

Factor	Transport		Collection		Packaging	
	Members to transport	Society to transport	Collect on request	Collect on schedule	Members provide packaging	Society provide packaging
CROP:						
Durable	X					
Perishable		X				
Robust						
Delicate						
Low value						
High value						
Price varies with grade						
Price fixed						
Seasonal harvest						
Continuous harvest						
MEMBERS:						
Well informed						
Ignorant						
Urgently need cash						
Not in urgent need						
Members indebted						
Not in debt to Society						
Members scattered						
Concentrated						
FACILITIES:						
Bad roads						
Good roads						
Good communications						
Poor communications						
Alternative outlets						
No alternative						

Factor	Opening hours		Grading		Payment	
	Centre open for short periods	Centre open all day	Members not observe grading	Members observe grading	Pay cash on delivery	Pay by cheque or account entry
CROP:						
Durable						
Perishable						
Robust						
Delicate						
Low value						
High value						
Price varies with grade						
Price fixed						
Seasonal harvest						
Continuous harvest						
MEMBERS:						
Well informed						
Ignorant						
Urgently need cash						
Not in urgent need						
Members indebted						
Not in debt to Society						
Members scattered						
Concentrated						
FACILITIES:						
Bad roads						
Good roads						
Good communications						
Poor communications						
Alternative outlets						
No alternative						

Handout 2 - Management Alternatives

The following schedule lists the major factors which affect the design of a collecting and receiving system for agricultural crops from a society's members.

With reference to the conditions in your co-operative, fill in the blank spaces opposite each factor for the crops, members and facilities as follows:

- Put "Y" if the crop, members or facilities are as described.
- Put "N" if they are the opposite.
- Put "-" if the question is irrelevant.

The Crop

- Is the crop perishable?
- Is the crop delicate?
- Is the crop of high value per tonne?
- Does the value of the crop vary according to its grade?
- Is the crop harvested on a seasonal basis only?

The Members

- Are the members well informed?
- Are the members in need of immediate cash payment at harvest time?
- Are the members indebted to the society?
- Are the members scattered over a wide area?

Facilities

- Are there adequate roads up to members' farms?
- Are there adequate communications between members of the society?
- Do the members have alternative outlets for this crop other than the society?

Handout 3 - Management Alternatives

The following schedule lists the major decisions which must be made when designing a collecting and receiving system for members' produce.

Fill in the squares opposite each statement in order to describe how the system in your co-operative operates. You should fill in the squares as follows:

Write a "Y" if the system is as described.

Write a "N" if the opposite applies.

Write a "-" if the question is irrelevant.

- The society transports members' crops from their farms to the collection centre.
- The society collects crops from members' farms according to a pre-set schedule and not on request.
- The society provides packaging for the journey from the farm to the collection centre.
- The collection centre is open all day every day.
- Members are able to observe their own crops being graded.
- Members are paid cash on delivery of their crops.

topic

4

the cost of collection

SESSION 4

THE COST OF COLLECTION

Objective: To enable trainees to calculate the total cost of alternative collection systems.

Time: One to one and a half hours.

Material: Role play briefs "The Careful Cotton Cultivators' Co-operative", parts I and II.

Session Guide:

- 1) Remind trainees that while the earlier session dealt with the issue of responsibility for moving crops from the member to the collecting point, it did not deal with the number or location of such points. This is a further decision which management must make.
- 2) Give a copy of the "Careful Cotton Cultivators Society's Manager's Brief" to a suitable trainee, and give copies of the "Members' Brief" to three other trainees. Send them out of the main classroom and allow them ten minutes to "think themselves" into their roles. Ensure that neither side sees the other's brief or has any conversation with them.
- 3) While the role players are thinking themselves into their roles, distribute copies of both briefs to the remaining trainees. Allow them to read them and without further discussion take a vote. Trainees should say whether they agree with the Members or the Manager. Some trainees may feel that neither is correct or be undecided. In every case, record the number for, against and undecided, and note the names of at least some of those on each "side". Warn trainees that they are about to observe a simulation of the meeting foreshadowed in the role play briefs. They are to act as observers and must be prepared to comment on:
 - How effectively each side puts its view.
 - The merit of whatever conclusion was reached.

- 4) Ask the "Manager" and the "Members" to act out the meeting; bring it to a close when they have reached a conclusion or after twenty minutes, whichever is the sooner.

Discuss the meeting and the issues with the role players and the observers. The starting point of the discussion will depend on the success of the meeting, but if it has ended in deadlock, or in a "victory" for one side or the other based on threats, goodwill or other non-quantitative process, lead trainees through the following arguments:

- a) What is the objective of each side as described in the role play briefs?

- To minimise their own short term costs.

- b) What were the respective costs for each of the two solutions to the collection problem?

- Members :

Central Depot - 1,000 members at \$20 each = \$20,000

10 Village Depots - 1,000 members at \$ 5 each = \$5,000

Society :

Central Depot - 1 depot at \$5,000 = \$ 5,000

10 Village Depots at \$2,500 = \$25,000

- c) Clearly the Members preferred ten village depots and the Society preferred a central depot. How should they approach the problem?

- Members' and the Society's interests are the same. They should both therefore aim to minimise the costs of the total system, regardless of who incurs these costs in the short term.

- d) What is the total cost of either alternative? Which is the most economical?

- Central Depot :

Members - 1,000 x \$20 = \$ 20,000

Society - 1 x \$5,000 = 5,000

Total Cost \$ 25,000

- 10 Village Depots:

Members - 1,000 x \$5	=	\$ 5,000
Society - 10 x \$2,500		25,000
Total Cost		\$ 30,000

- The Central Depot is thus \$5,000 less expensive in total, and it should be in the members' interest to approve the Manager's decision, assuming that there are no other alternatives.

5) Ask trainees what factors might reasonably incline members to object to the Central Depot solution, even when they have understood the simple cost calculations already described and appreciate that the total cost for the single depot is lower.

- Members may believe that if the Society earns a larger surplus, they will not necessarily benefit from it. It may be spent on unnecessary investments, on political, social or educational projects with which they are not in sympathy or it may be stolen through corruption. If their suspicions are correct, they are right to minimise their own short term costs.
- Members may need every cent from their cotton crop as soon as it is harvested. Their immediate need for cash, or the rate of decline in the value of money, may mean that it is generally in their interest to save \$15 at once than to receive \$20 in several months time.

6) Ask trainees what factors in addition to the above might reasonably incline the Manager to agree with the Members, in spite of the clear \$5,000 saving to be gained by operating a Central Depot.

- Members may be willing to build local depots on a self-help basis, and thus to reduce the costs.
- Some Members may sell their cotton elsewhere or produce less cotton, if they are discouraged by the cost and trouble involved in transporting their cotton to a Central Depot. Low production would hurt them and the Society.
- The burden of transporting cotton to a Central Depot may bear particularly heavily on poorer Members with smaller crops. If

the poorer Members also tend to be at the fringe of the Society's area, the village collection centres might still be preferred.

- Members may be so dissatisfied with the decision, even if it is clearly in their long term interest, that they seriously reduce their support for the Society. It may be worth \$5,000 to have ten village centres in the interests of the long term future of the Society.

Stress that intangible aspects of this type should not be ignored. It is vital, however, first to assess the quantitative aspects. Management can then judge whether the force of the intangibles is or is not sufficient to counteract the quantitative arguments in favour or against a particular solution.

- 7) Trainees may have attempted to suggest that there may be other solutions apart from one Central Depot or ten village centres. Point out that they may be correct and that this issue will be dealt with in the next session.

The Careful Cotton Cultivators' Co-operative - Part I

Role play brief: The Manager

You are the Manager of the newly formed Careful Cotton Cultivators' Co-operative which has just been started to market cotton produced by 1,000 farmers occupying a newly irrigated area about ten kilometers by ten kilometers. The Co-operative Officer from the Ministry, and the Committee Members, have impressed you with the need for the utmost economy. The first crop will be harvested in about six months time, and you have just completed your plan for collecting members' cotton. A number of cotton societies have failed elsewhere in the country, partly because of extravagance and over-spending. You are determined to avoid this, and have therefore decided to ask all members to bring their cotton crop to a central collecting point, at the Society's Headquarters approximately in the middle of the area. The National Ginnery Company will in turn collect the cotton from the Central Depot.

Some people suggested that the Society should operate collecting centres in each of the ten village centres in the area, but you were taught in co-operative management training courses to make decisions on the basis of figures rather than guesses or political pressure. You estimated the cost of operating one Central Depot to be \$5,000 for the season; smaller depots would cost rather less each, about \$2,500 in fact, including the extra cost of transport which would be charged by the National Ginnery Company, but it is obviously more efficient to run one Central Depot. You have therefore decided to do this, and informed the membership accordingly. You have just heard that a group of members have come to see you to discuss the decision. You realise that they are simple illiterate people, but you are confident that they will agree with you once you have clearly explained the figures to them.

The Careful Cotton Cultivators' Co-operative - Part IIRole play brief: The Members

You are a member of the Careful Cotton Cultivators' Society. Cotton has recently been introduced in your area as a result of the new irrigation scheme, and your Society has 1,000 members spread over an area of approximately ten kilometers by ten kilometres, 10,000 hectares. Your first cotton crop will be harvested in approximately six months, and you have just heard that the Society's management has decided that members should bring their cotton to a central collection point in the middle of the area. You will have to travel about six kilometers to do this. Like your fellow members, you have no access to a motor vehicle and you will probably pay a villager who owns a bullock-cart to transport your cotton.

This will cost about \$20 and you can ill afford to pay this. You, and the other members you have spoken to, believe that the Society should operate a collecting depot in each of the ten village centres in the Society's area. You and your fellow members could probably carry most of the cotton there yourself since it would only be one or two kilometers, but you would probably have to hire a labourer to carry some of it for about \$5. Your fellow members are in the same position. They are all very angry that what is supposed to be "their" Society should attempt to exploit them in this way, and they have asked you and a few colleagues to call on the Society's Manager to make a formal complaint. You are about to meet him.

topic

5

**the number and location
of collection points**

SESSION 5

THE NUMBER AND LOCATION OF COLLECTION POINTS

Objective : To enable trainees to determine the most economical number and location of collecting points for a given crop.

Time : One and a half to two hours.

Material : Case study "The Careful Cotton Cultivators' Co-operative" parts III and IV.

Session Guide :

- 1) Remind trainees that the previous session was artificially simplified in that it was assumed there were only two alternatives. It was possible only to have one or ten collection points, and there was no mention of the specific location of these points.
- 2) Divide trainees into groups of up to five members each. Distribute the case study, part III, and allow up to 45 minutes for its solution. Circulate among the groups at work, and assist them with the first stages towards a solution if necessary.
- 3) Reconvene the class and ask one group which has been less successful than most to present its solution, so far as it goes, and to share their difficulties. Invite a representative of a more successful group to present their conclusions, and encourage discussion so that those with more experience with this type of calculation will be able to share their insights with others who are less fortunate.

The objective is to find the number of depots which gives the lowest total cost. Trainees should have laid out the figures as follows:

Member Costs :

10 depots mean that 1,000 members spend \$ 5 each	=	\$ 5,000
3 depots mean that 1,000 members spend \$ 8 each	=	\$ 8,000
2 depots mean that 1,000 members spend \$12 each	=	\$ 12,000
1 depot means that 1,000 members spend \$20 each	=	\$ 20,000

Society Costs :

10 depots mean expenditure of	10 x \$2,500	=	\$ 25,000
3 depots mean expenditure of	3 x \$3,000	=	\$ 9,000
2 depots mean expenditure of	2 x \$4,000	=	\$ 8,000
1 depot requires expenditure of	1 x \$5,000	=	\$ 5,000

- 4) Ask trainees to read off the members' and the Society's costs at various numbers of depots, and to add these together to come to the total cost. What number of depots provides the lowest total cost? Their answers should be as follows:

	<u>Members' Costs</u>	<u>Society's Costs</u>	<u>Total Costs</u>
10 depots	\$ 5,000	\$ 25,000	\$ 30,000
3 depots	\$ 8,000	\$ 9,000	\$ 17,000
2 depots	\$ 12,000	\$ 8,000	\$ 20,000
1 depot	\$ 20,000	\$ 5,000	\$ 5,000

Three depots are clearly the most economical solution.

- 5) Ask trainees whether the figures on which these calculations are based, and in particular the estimates of member costs, would be obtainable in their societies; must decisions about numbers and locations of collecting points be based on political pressures, existing facilities or simple convenience rather than calculations of this sort?

Stress that they must attempt some estimate of alternative costs for the Society and for members. It is better to have very approximate guesses to assist decisions of this sort rather than to have no data at all.

- 6) Distribute copies of the case study, part IV, to all trainees. Allow them up to 15 minutes to read it. Take a vote without further discussion to record the number in favour of allocation by production and those in favour of allocation by the number of members.

After taking the vote ask those in favour of each alternative to suggest reasons. These may include the following:

By Production :

- The capacity of storage and transport equipment is measured by the volume of the crop. It is irrelevant whether a given tonnage has been produced by one or by many members.
- The Society's income depends on volume. Its sales which cover its collection, processing and marketing costs depend on the quantity of produce handled, not on the number of members providing it. Facilities should therefore be provided in proportion to volume.
- Members should not be encouraged to deliver small quantities which are uneconomic for them and for the Society. The cost per kilogram of dealing with small deliveries is far higher than for larger ones, so that larger deliveries should be encouraged.

By Number of Members :

- The workload of a collection centre depends mainly on the number of consignments received and not on the volume. The facility should therefore be based on the likely workload.
- The Society exists to serve members' needs, and should be able to offer the same level of service to all members, regardless of the scale of their deliveries.
- Co-operative societies are often taken over by a minority of richer members. This process will be facilitated if collection facilities favour members with large holdings.

It is possible that trainees will all incline towards the economic rather than the social point of view, since they are society managers and not members. In this case it is necessary to stress the social arguments, perhaps by asking a trainee to act the role of a member from the Eastern Area.

- 7) Encourage discussion. If appropriate ask for a further vote to see whether any trainees have changed their views.

There is no clear cut answer to this problem which is a typical example of the conflict between economy and service to members. In most societies it is perhaps advisable to base facilities on the number of members rather than on the volume of production.

This will promote equity and more speedy service for all members, and the extra costs for the society will be covered by the greater convenience and saving for members.

The Careful Cotton Cultivators' Co-operative - Part III

The Manager of the Careful Cotton Cultivators' Co-operative Society was pleased that his meeting with the member group had not ended in disagreement. He had collected a large volume of information, after a great deal of work by himself, his staff and the members. He now had to show that he could use all this information to make what was the best decision in the interests of the Society as a whole rather than viewing the problem of collection from the point of view of members or the Society as if they were not the same as one another.

After some investigation and meetings with other societies, the Manager estimated that the Society's cost of operating collecting depots would be as follows:

1 Central Depot	=	\$ 5,000
2 Depots	=	\$ 4,000 each
3 Depots	=	\$ 3,000 each
10 Depots	=	\$ 2,500 each

The cost fell with the number of depots, because smaller premises, less equipment and less staff would be needed to collect less cotton, but it was impossible to operate a collection point for less than \$2,500 as this covered only the most basic level of supervision, labour, security and shelter.

fall progressively as the number increased and the number of members using it therefore fell.

He had asked the members to find out how much it would cost to transport their cotton to collection points if there were less than ten of them. They had had some difficulty in doing this but eventually they came up with the following figures:

10 Depots	=	Cost per member \$ 5
3 Depots	=	Cost per member \$ 8
2 Depots	=	Cost per member \$ 12
1 Depot	=	Cost per member \$ 20

They could not work out exactly what it would cost them if there were nine, eight, seven, six, five or four depots, but they thought that the cost per member would rise proportionately as the distance to the depot increased.

The Manager had now to find out which was the best number of depots from the point of view of members and the Society as a whole.

Assignment : Using the information provided in the case study about members' and the Society's costs, work out what number of depots would be the least expensive in total.

The Careful Cotton Cultivators' Co-operative - Part IV

The Manager of the Careful Cotton Cultivators' Society was thoroughly confused. He thought that he had satisfactorily solved the problem of the collection depots, but he was now faced with two totally conflicting sets of advice. He wanted to know which one he should follow.

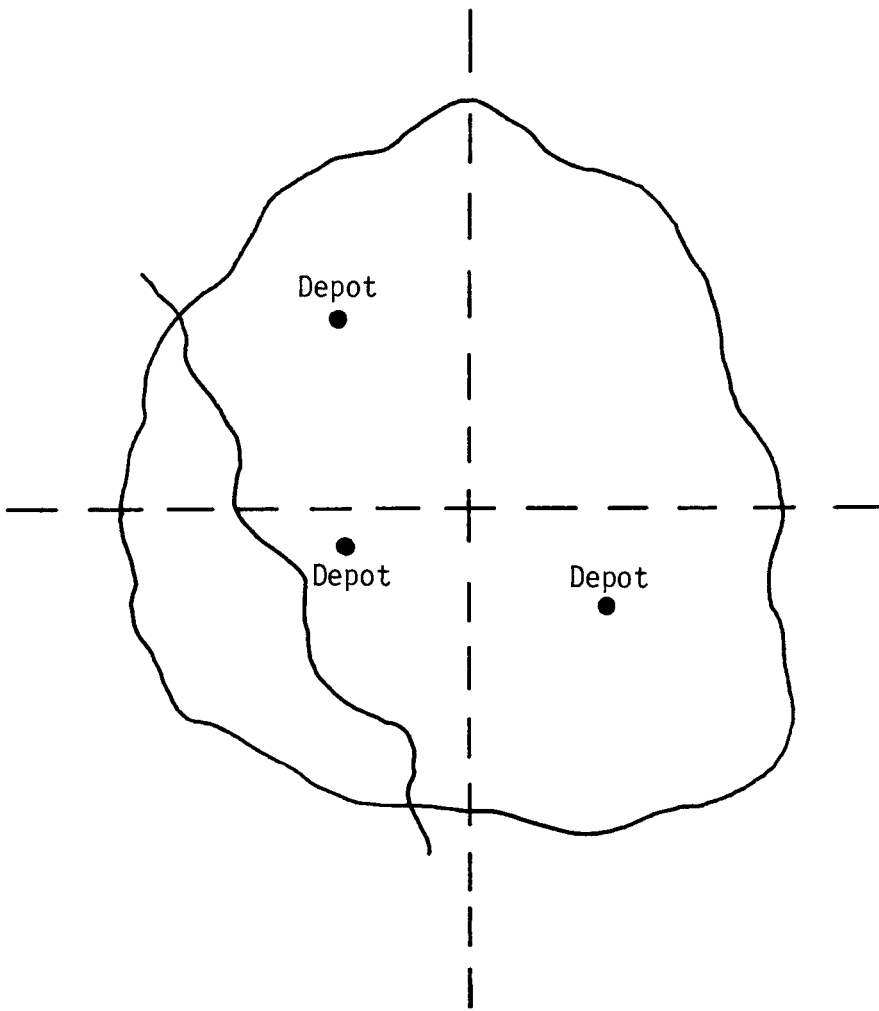
After he had decided to open three collection points the Manager was asked to suggest where they should be located. This would involve a compromise and some difficulty, since some members would inevitably be better served than others. In order to avoid any question of bias therefore, the Manager had asked a visiting economist and a sociologist from the University each to make an independent survey and to suggest where the depots should be located. Now he had had their reports and he looked yet again at the two summaries and wondered what to do next.

FROM: Edward Economist
TO: Manager, Careful Cotton Cultivators' Society
SUBJECT: Location of Collection Points

As requested I append my report on the above subject. In summary my recommendations are as follows:

- The Society's 1,000 members farm in an area of approximately 100 square kilometers. Your own cropping estimates suggest that some 10% of the membership, resident in the fertile south-western area, and farming about twenty hectares each, will produce 30% of the total crop. A further 20% of the members, resident in the north-western area and producing a wider assortment of crops, are according to your estimates going to produce a further 30% of the total Society throughput, from their holdings which average fifteen hectares each. The remaining 40% of the Society's throughput will, it is estimated, be produced by the remaining 70% of members. They occupy the semi-arid eastern part of the Society's area and farm an average of five hectares each.
- The depots should be located to serve these three groups in line with their projected production:
 - Depot A in the south-western area
 - Depot B in the north-western area
 - Depot C in the eastern area.Each depot will have an approximately equal throughput, so that the equipment will be efficiently employed and members will feel that the resources have been deployed fairly in relationship to the potential production.
- The following sketch map shows very simply where the collection points should be located.

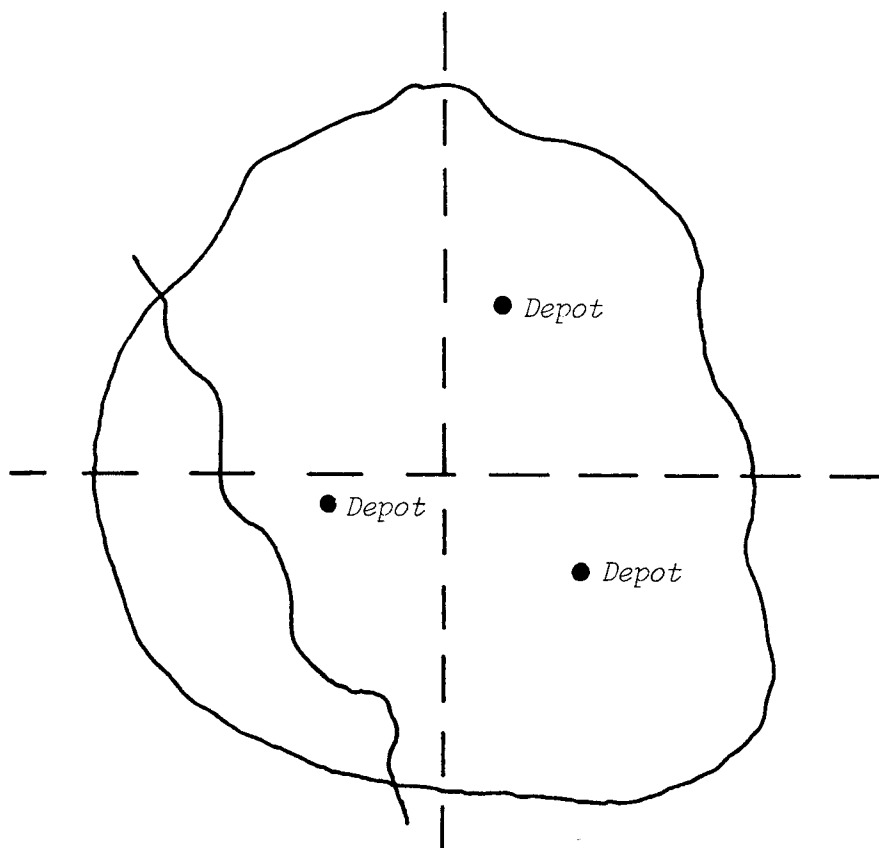
Sketch Map showing Recommended
Sites for Collection Points



FROM: Sayeed Sociologist
TO: Manager, Careful Cotton Cultivators' Society
SUBJECT: Location of Collection Points

Thank you for asking me to advise on this problem; my recommendations may be summarised as follows:

- The excellent maps which you possess show clearly that some 70% of your 2,000 members live in the eastern half of the Society's area, while the remaining 300 live in the western half.
- Since all members will be growing cotton, the three collection points should be located in relation to population, with two depots serving the rather more thickly populated eastern area and one serving the sparsely occupied western area.
- The following sketch map very simply shows the suggested locations.



topic

6

**optimising
management decisions**

SESSION 6

OPTIMISING MANAGEMENT DECISIONS

Objective : To enable trainees to measure trade-offs involved in crop collection problems and to design optimum solutions.

Time : Two to three hours.

Material : Case study "The Careful Cotton Cultivators' Co-operative", parts V and VI and Worksheet.

Session Guide :

- 1) Ask trainees to imagine that they are standing at the side of a busy road, deciding when to cross. What factors will they consider, perhaps unconsciously, when making the decision?
 - The apparent distance of any on-coming traffic.
 - The likely future speed of that traffic.
 - The likely speed at which they will cross the road.
 - The urgency of their need to reach the other side.

Demonstrate that even a simple everyday decision of this sort is in fact very complex, and involves a number of implicit estimates and mathematical calculations.

- 2) Ask trainees what they would do if they had no experience of traffic or their own walking speed.
 - They might wait unnecessarily long before crossing.
 - They might cross too soon and be run over.
 - They might watch other people with experience and cross when they do.

Decisions require experience about similar such situations in the past.

- 3) Ask trainees how their behaviour will differ if it is a matter of desperate urgency to cross the road, or if they are carrying a very precious article which will be destroyed if it is dropped or bumped in any way.
- They will run across among the traffic and take a large risk of being run over.
 - They will wait until no traffic is coming at all, even if this means a long delay.

Decisions depend on experience and the cost or benefit associated with success or failure.

Management decisions are just the same as a decision when to cross the road. The Manager must find out or estimate:

- Information about distances, times, people's behaviour and so on, based on experience.
- Information on costs and benefits.

He must then analyse the information in such a way as to help him make the right decision.

- 4) Ask trainees whether they ever have to decide which members' or sub-depots' crops should be delivered to which central depot or customer premises. Problems of this sort, involving more than one collection and receiving point, can often be analysed and solved by "common sense" but can be more effectively solved by the use of what is known as "linear programming".

Distribute copies of the case study, part V, or display a summary of the problem on the chalkboard/OHP.

Ask trainees first to attempt to solve the problem by "common sense". Allow up to ten minutes for this. Some trainees may reach a solution, or the correct solution, by chance, but it is unlikely that many will

succeed unless they have previously been exposed to elementary linear programming techniques. It is not necessary to explain the mathematics underlying this technique; explain the procedure to trainees as follows:

- a) Ask trainees how they laid out the problem. Stress that clear neat presentation of facts, even if nobody except the writer will ever see them, is essential in order to view the problem as a whole and to avoid mathematical errors.

Evolve the following presentation from trainees' suggestions:

	Ginnery A Shipping Costs	Ginnery B Shipping Costs	Total Supply
Member X	\$ 2	\$ 10	100
Member Y	\$ 5	\$ 8	200
Member Z	\$ 6	\$ 19	220
Total Capacity	250	270	520

Ensure that trainees appreciate:

- The figures in the cells are the transport costs per unit from the respective members' farms to the ginnery.
 - The figure of 520 in the lower right-hand corner is the total of available production and of the ginnery capacity.
 - The objective is to find out what amount must pass from each member to each ginnery in order to minimise the total transport cost.
- b) Stress that the first stage is to produce a "trial" solution. It need not be the best, or "optimum", but further options can be evolved from it. Elicit the suggestion that the first attempt should work from the top left-hand or "north-west" corner, by putting as much as possible in that cell. This leaves no more product from Member X for Ginnery B, so the following cell is empty. Trainees should then fill in the first cell of the second

row in the same way. No more than 150 units can go there, since anything over this would exceed the total of 250 required by Ginnery A. The balance from Member Y must therefore go to Ginnery B. Member Z's crop must all go to Ginnery B for the same reason. The trial solution is now complete.

	Ginnery A Units	Ginnery B Units	Total Supply
Member X	100	nil	100
Member Y	150	50	200
Member Z	nil	220	220
Total Capacity	250	270	520

- c) Ask trainees what they think might be the next stage. Elicit the suggestion that they must now calculate the cost of this trial solution, in order to be able to compare it with any alternative. Ask trainees to calculate the cost. Ensure that they all individually confirm their understanding of the exercise by producing the following figures:

$$\begin{aligned}
 \text{Member X} &= 100 @ \$2 + \text{nil} @ \$10 = \$ 200 \\
 \text{Member Y} &= 150 @ \$5 + 50 @ \$ 8 = \$ 1,150 \\
 \text{Member Z} &= \text{nil} @ \$6 + 220 @ \$19 = \$ 4,180 \\
 &\qquad\qquad\qquad \text{Total Costs} \qquad\qquad \$ 5,530
 \end{aligned}$$

Show trainees how to fill in the cost figures in the appropriate cells:

	Ginnery A Units	Costs	Ginnery B Units	Costs	Total Supply / Costs
Member X	100 @ \$2 = \$ 200		nil @ \$10 =	nil	100 \$ 200
Member Y	150 @ \$5 = \$ 750		50 @ \$ 8 = \$	400	200 \$ 1.150
Member Z	nil @ \$6 =	nil	220 @ \$19 = \$	4,180	220 \$ 4,180
Total Capacity	250	\$ 950	270	\$ 4,580	520 \$ 5,530

- d) Ask trainees whether they suspect that this is the optimum solution. Elicit the suggestion that it is not, because the maximum amount of cotton, 220 bags, has been transported at the maximum cost of \$19 a bag. Ask for alternatives, and elicit the principle that the second stage is to re-allocate as much as possible of the crop from the cell with the highest cost figure in it to the cheaper ginnery and to do the same with the next most expensive cell and so on. Ask trainees to suggest a second solution based on this method, and elicit the following:

	Ginnery A		Ginnery B		Total	
	Units	Costs	Units	Costs	Supply /	Costs
Member X	nil @ \$2 = \$	nil	100 @ \$10 = \$	1,000	100	\$ 1,000
Member Y	30 @ \$5 = \$	150	170 @ \$ 8 = \$	1,360	200	\$ 1,510
Member Z	220 @ \$6 = \$	1,320	nil @ \$19 =	nil	220	\$ 1,320
Total Capacity	250	\$ 1,470	270	\$ 2,360	520	\$ 3,830

- e) Ask trainees to suggest any further improvements, working on the same principle of attempting to transfer production from the most expensive cell. They should see that any further transfer of Member Y's crop to Ginnery A will force some of Member Z's crop to be taken to Ginnery B at \$19 a bag. They should then examine the next most expensive cell, that from Member X to Ginnery B. They should see that if Member Y's 30 bag delivery to Ginnery A is replaced by Member X's crop, this will force re-allocation as follows:

	Ginnery A		Ginnery B		Total	
	Units	Costs	Units	Costs	Supply /	Costs
Member X	30 @ \$2 = \$	60	70 @ \$10 = \$	700	100	\$ 760
Member Y	nil @ \$5 =	nil	200 @ \$ 8 = \$	1,600	200	\$ 1,600
Member Z	220 @ \$6 = \$	1,320	nil @ \$19 =	nil	220	\$ 1,320
Total Capacity	250	\$ 1,380	270	\$ 2,300	520	\$ 3,680

- f) Invite further suggestions. It should be clear that this is the optimum solution, which is 407 less expensive than the first trial.

5) Distribute the case study, part VI, or display the exercise on the chalkboard/OHP and ask trainees to solve the problem in the same way. Give each trainee one or more copies of the Worksheet to allow them to make the calculations more quickly. After 30 minutes ask one trainee who has successfully completed the exercise to go through his solution on the chalkboard/OHP.

Ensure that he or she follows the same procedure as was used for the first example, and that every trainee understands every stage.

a) The initial layout should be as follows and the trial solution is then calculated and valued.

	Ginnery C		Ginnery D		Total	
	Units	Costs	Units	Costs	Supply /	Costs
Member P	300 @ \$8 =	\$ 2,400	nil @ \$6 =	nil	300	\$ 2,400
Member Q	450 @ \$3 =	\$ 1,350	nil @ \$5 =	nil	450	\$ 1,350
Member R	50 @ \$7 =	\$ 350	150 @ \$4 =	\$ 600	200	\$ 950
Member S	nil @ \$3 =	nil	550 @ \$9 =	\$ 4,950	550	\$ 4,950
Total Capacity	800	\$ 4,100	700	\$ 5,550	1,500	\$ 9,650

b) The second trial, produced by re-allocating the most expensive cell, is as follows:

	Ginnery C		Ginnery D		Total	
	Units	Costs	Units	Costs	Supply /	Costs
Member P	nil @ \$8 =	nil	300 @ \$6 =	\$ 1,800	300	\$ 1,800
Member Q	250 @ \$3 =	\$ 750	200 @ \$5 =	\$ 1,000	450	\$ 1,750
Member R	nil @ \$7 =	nil	200 @ \$4 =	\$ 800	200	\$ 800
Member S	550 @ \$3 =	\$ 1,650	nil @ \$9 =	nil	550	\$ 1,650
Total Capacity	800	\$ 2,400	700	\$ 3,600	1,500	\$ 6,000

- c) Trainees should be encouraged to attempt further solutions, but should realise by inspection that \$6,000 is the lowest cost figure.
- 6) If time allows set further problems. Trainees may enjoy the ingenuity of the mathematical exercise. Stress that such techniques are no substitute for management ability. It is important to plan the optimum solutions to any problem in order to reduce costs, but it is even more important, and more difficult, to manage the implementation of these plans in such a way that what was intended to happen actually does. In general, a well managed plan which is not optimal is better than a mismanaged optimal plan.

The Careful Cotton Cultivators' Co-operative - Part V

The Allocation Problem

The Manager of the Careful Cotton Cultivators' Co-operative knew that there were an enormous number of alternatives but wanted to decide which was best. Member X was going to produce 100 units of cotton, Member Y was going to produce 200 units and Member Z was going to produce 220 units. This cotton had to be delivered to two ginneries. Ginnery A would absorb 250 units and Ginnery B 270 units. The problem was to decide which Members' crops should be sent to which Ginnery.

The Manager had obtained estimates from a transport company and found that it cost \$2 to transport a unit from Member X to Ginnery A and \$10 to transport a unit from Member X to Ginnery B. It cost \$5 to transport a unit from Member Y to Ginnery A and \$8 to transport a unit from Member Y to Ginnery B, while it cost \$6 to transport a unit from Member Z to Ginnery A and \$19 to transport a unit from Member Z to Ginnery B.

Assignment : What is the least expensive way of allocating the three members' production between the two ginneries?

The Careful Cotton Cultivators' Co-operative - Part VI

The Second Allocation Problem

The Manager of the Careful Cotton Cultivators' Co-operative faced a further problem. Now he had to decide how to divide the produce of four members between two further ginneries. Member P was going to produce 300 units of cotton, while Member Q was going to produce 450 units, Member R was going to produce 200 units and Member S was going to produce 550 units, making a total of 1,500 units. 800 of these units were required by Ginnery C and 700 by Ginnery D.

The shipping costs were also different from one another. It cost \$8 to transport a unit from Member P to Ginnery C and \$6 from Member P to Ginnery D. It cost \$3 from Member Q to Ginnery C and \$5 from Member Q to Ginnery D. The cost of transporting a unit from Member R to Ginnery C was \$7 and it cost \$4 from Member R to Ginnery D. The cost from Member S were \$3 to Ginnery C and \$9 a unit to Ginnery D.

Now the Manager had to decide how much of each members' production should be delivered to each Ginnery.

Assignment : What is the least expensive way of allocating these four members' production between these two ginneries?

Worksheet

	GINNERY C		GINNERY D		TOTAL	
	Units	Costs	Units	Costs	Supply /	Costs
MEMBER P						
MEMBER Q						
MEMBER R						
MEMBER S						
TOTAL CAPACITY						

	GINNERY C		GINNERY D		TOTAL	
	Units	Costs	Units	Costs	Supply /	Costs
MEMBER P						
MEMBER Q						
MEMBER R						
MEMBER S						
TOTAL CAPACITY						

	GINNERY C		GINNERY D		TOTAL	
	Units	Costs	Units	Costs	Supply /	Costs
MEMBER P						
MEMBER Q						
MEMBER R						
MEMBER S						
TOTAL CAPACITY						

topic

7

transport scheduling

SESSION 7

TRANSPORT SCHEDULING

Objective: To enable trainees to schedule the collection of crops in the most efficient way.

Time: Two to three hours.

Material: Case study "The Careful Cotton Cultivators' Co-operative", part VII.

Session Guide:

- 1) Ask trainees to suggest what is the main reason why their societies are not able to offer their members as good a crop collection service as they would like. Trainees may suggest a number of problems, but may be expected to focus on difficulties such as;
 - insufficient vehicles;
 - vehicle breakdowns;
 - shortage of spare parts;
 - bad roads.

Remind trainees that most farmers blame the weather or other external factors rather than themselves when things do not go well. Trainees, like most people, prefer to blame factors outside their own control rather than to look at the ways in which they themselves may be able to improve their situation. Ask trainees what they themselves might do, without additional resources from outside, to improve the level of collection service they offer members.

Elicit suggestions such as:

- Improve driver training and supervision.
- Improve vehicle inspection and maintenance routines.
- Improve spare parts purchase and stocking systems.
- Improve use of roadworthy vehicles by better scheduling.

Stress that management has been defined as "making the best use of available resources". Their job as co-operative managers is not to complain about things they cannot change but to do as well as possible in the circumstances however discouraging they may appear.

Vehicle purchases, driver supervision, maintenance and scheduling in general are dealt with in the MATCOM course on Transport Management. The following scheduling exercises deal with some of the particular problems likely to arise when collecting produce from members' farms.

- 2) Divide trainees into groups of no more than five members. Distribute the case study and allow up to one hour for completing the assignment. Stress that no techniques such as linear programming are required. The main need is for rapid accurate arithmetic and this is often far more important than knowledge of specialised techniques.

- 3) Reconvene the class. Ask groups in turn briefly to state their answers to the first question. Write down their answers on the chalkboard/OHP. They will probably cover a wide range, since the conclusion depends on the way in which it has been worked out. Ask a representative from the group with the highest and the lowest number of days to explain how they obtained their answer. Go through the calculations which may be laid out in the following way:

Village	Loads	Journeys	Total Bags	Travelling Time (both directions) for One Journey	Loading Time	Total Time Travelling	Total Time
					Minutes	Minutes	Minutes
A	3 & 1/3	4	1,000	40 minutes	125	160	285
B	3	3	900	48 minutes	100	144	244
C	3 & 1/3	4	1,000	24 minutes	100	96	196
D	2 & 2/3	3	800	48 minutes	100	144	244
E	3 & 1/3	4	1,000	120 minutes	200	480	680
F	1	1	300	120 minutes	50	120	170
G	1	1	300	168 minutes	150	168	318
Sub Total		20	5,300		Sub Total		2,137

Village	Loads	Journeys	Total Bags	Travelling Time (both directions) for One Journey	Loading Time	Total Time Travelling	Total Time
					Minutes	Minutes	Minutes
Sub Total		20	5,300	Sub Total		2,137	
H	1 & 1/2	2	450	228 minutes	150	456	606
J	3 & 1/3	4	1,000	228 minutes	250	912	1,162
Total		26	6,750	Total		3,905	
						+ 26 unloading at 30 minutes	780
						Grand Total	4,685

Total minutes for travelling to each village, loading at each farm, returning to depot and unloading = 4.685 Minutes
 Divided by 60 minutes = 78.1 Hours
 Divided by 82 hours = 9.2 Days

Discuss and if possible correct any significant errors which have led to very different results. It is clearly not possible to rent a vehicle for 9.2 days. Trainees may have concluded that the actual number should be lower or higher than the calculated result. Ask for reasons in favour of reducing or increasing the number of days.

More Than 9.2 Days: (i.e. 10, 11 or 12)

- The calculations do not allow for time wasted when the vehicle completes one journey before the end of a day but cannot start a further journey because there is not enough time remaining to return to the depot before the evening.
- No allowance is made for breakdowns or unexpected delays in loading, or for members' failure to have their crop ready as planned.

Less Than 9.2 Days: (i.e. 8 or less)

- The calculations do not allow for the fact that loads from adjacent villages may be combined thus saving time, such as Villages A and D.

Trainees should conclude that it is wiser to choose a higher rather than a lower figure. 12 days is a reasonable suggestion.

4) Ask trainees for their answers to the second question. Their calculations should be as follows:

- Receipts from 10 cents per bag charge = $6,750 \times 10 \text{ cents} = \$ 675$
- Cost of hire @ \$60 a day $\times 12 \text{ days} = \$ 720$

Ask trainees what the Manager should conclude about the economic viability of the collection service. Should he increase or reduce the charge?

The amount of surplus or subsidy is in any case very small, and a reduction or extra charge of even one cent per bag would make the charge too high or too low. It should therefore be retained at 10 cents.

5) Ask trainees to identify factors such as the following which will affect the Manager's decision:

- The possibility of obtaining extra days transport at the last moment, even at high cost.
- The likely accuracy of the time and coverage estimates on which the calculations have been based.
- The possibility of unexpected problems such as floods, impassable roads or late harvest which would lead to delays and the need for a longer period of vehicle availability.

6) Stress as in the previous session that planning of this sort is only a small part of the management task. It is even more important to manage the plan properly. Ask trainees what simple management tasks are often neglected, so that even a well designed optimum plan does not work as intended:

- The driver is not properly guided to members' farms.
- Fuel is not available when necessary.
- There is not enough labour for unloading quickly at the depot.
- Members are not informed when and how their crop is to be prepared ready for collection.

The following sessions will concentrate on these management tasks.

The Careful Cotton Cultivators' Co-operative - Part VII

After much discussion it was agreed that the Careful Cotton Cultivators' Co-operative Society would operate three collection centres. The National Ginnery Corporation agreed to collect members' crops from these centres, rather than demanding that it should all be brought to one central point, but the Society had agreed to collect members' crops from their farms and to deliver the crop to the collection centres if members wished. In order to cover the cost it was agreed that the Society would deduct 10 cents a bag from members' receipts. The members who preferred to avoid this deduction by delivering their own crop were free to do so.

The Manager had succeeded, with some difficulty, in finding out which members wanted the Society to collect their cotton and how much they would be likely to have ready. He had attempted to summarise the information for each of the three collection centres. A copy of the data for the south-western area is shown in the following pages together with a sketch map of the area in question.

In order to be sure of having transport, it was necessary to order a vehicle well in advance. The Manager had therefore to work out for how many days he needed the vehicle for each of the three zones. The Co-operative Union Transport Service, from whom the vehicle would be hired, had ten-ton vehicles which carried a maximum load of 300 standard sacks of cotton lint. For short haul work of this kind, the Union charged a flat rate of \$60 a day, regardless of distance, and the Manager was also anxious to find out whether the 10 cents levy per bag would cover this expense. The Committee had laid down that the Society should break-even on this transaction. Members who made use of this service should pay the full costs but no more.

The Union vehicle would be garaged at the Collection Depot during the period of hire, and the driver was allowed to work for eight and a half hours a day, including 30 minutes for lunch. The vehicle had to return to the Collection Depot each evening, but since it would be securely locked up over night it could be unloaded the following morning if time was not sufficient the previous evening. It took 30 minutes on average to unload the vehicle at the Collection

Depot and to take the necessary paperwork from the driver. The Union's employees were members of a national trade union, and there was no question of their working over eight and a half hours or missing any of their lunch periods. The vehicle could travel at 30 km/h on tarmac roads and 10 km/h on earth roads.

The Manager estimated from past experience elsewhere that it would on average take five minutes to load each member's crop, regardless of how many bags there were, since more time was spent on checking, marking and conversation than actually loading the bags. Since members' farms were generally quite small, the period of five minutes was also sufficient to cover the time spent moving from one farm to another in the same village area.

Assignment :

- 1) For how many days should the Society rent a vehicle in order to collect the cotton from the nine communities in the southwestern zone?
- 2) Will the 10 cents per bag levy be more or less than enough to cover the cost of hiring a vehicle?

Details of South Western Zone


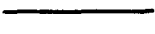

Distances from Collection Depot :

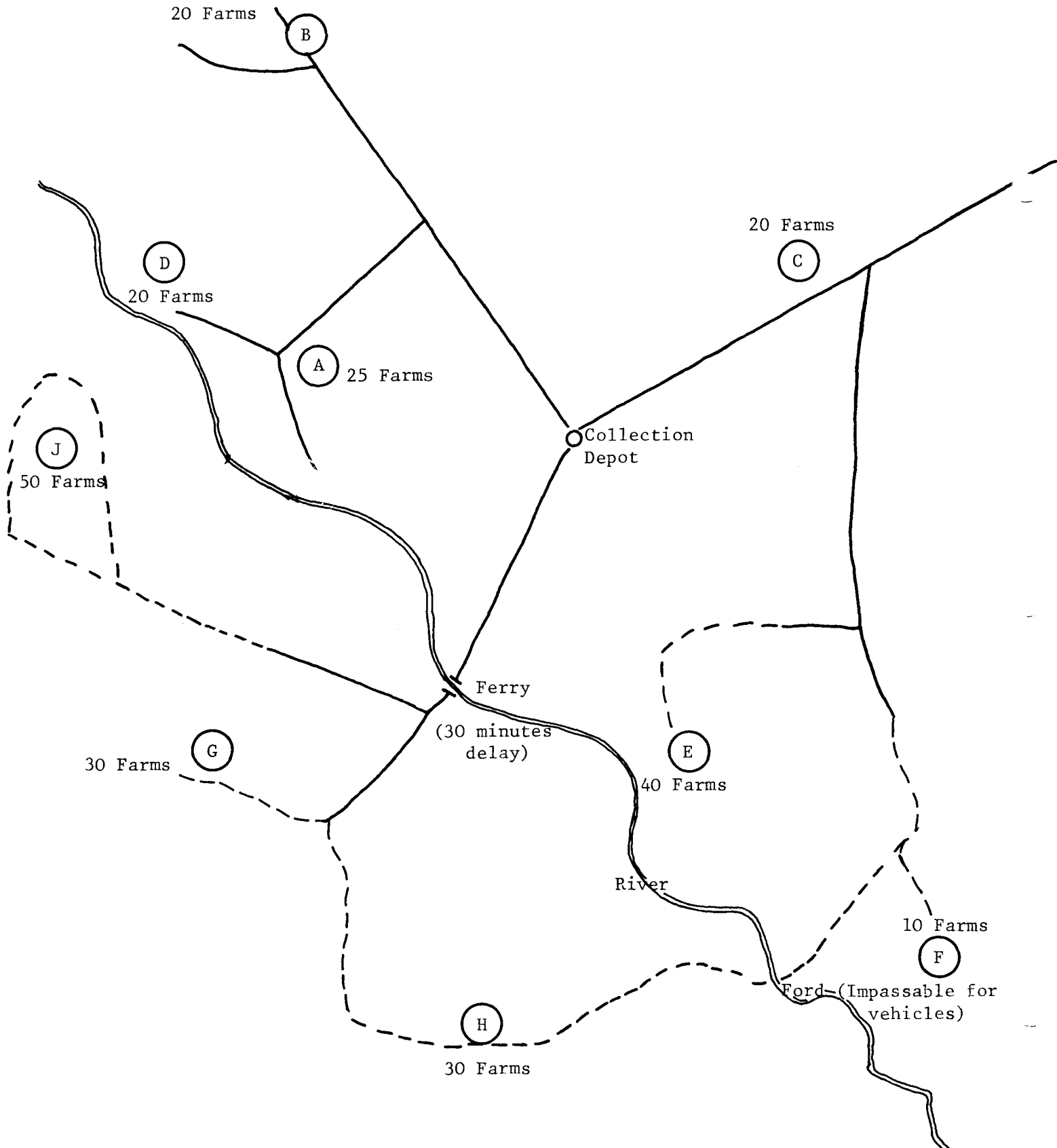
Village	Hard Top Road kilometres	Earth Road kilometres	Total kilometres
A	10	nil	10
B	12	nil	12
C	6	nil	6
D	12	nil	12
E	15	5	20
F	15	5	20
G	12	5	17
H	12	10	22
J	12	10	22

Average Load per Farm:

<u>Village</u>	=	<u>Bags</u>
A	=	40
B	=	45
C	=	50
D	=	40
E	=	25
F	=	30
G	=	10
H	=	15
	=	20

South-Western Zone of C.C.C.C. Area

Key:  = River
  = Hard Top Road
  = Earth Road



topic

8

informing members

SESSION 8

INFORMING MEMBERS ABOUT COLLECTION SYSTEMS

Objective: To enable trainees to select appropriate methods for informing members about collection arrangements.

Time: One to two hours.

Session Guide:

- 1) Prepare in advance on OHP transparency or poster, or write the following information on the chalkboard and cover it up before the session begins.

<u>CROP COLLECTION ARRANGEMENTS</u>	
<u>Dates:</u>	April 19th to 21st - 23rd and 24th, 1982.
<u>Time:</u>	11.00 a.m. to 3.30 p.m.
<u>Place:</u>	Salim's Delivery Yard, Corner of Liberty and Main Street, Freedomville.
<u>Acceptable Loads:</u>	250 to 2,000 kilograms.
<u>Packing:</u>	In sacks of between 45 and 50 kilograms each.

When the class is assembled, warn them that they are about to have twenty seconds to observe a typical notice about collection arrangements. The Instructor should read it out slowly, and trainees should read it as well as they can in the time, but should not attempt to make any written notes of its content now or later.

- 2) Ask trainees to assume that a society has designed the most economical and effective system for collecting its members' crops. What remains to be done before the system will be properly used?
 - Members must have all the necessary information to enable them to make use of the system.

- 3) Ask half of the class to write down all the items of information members would need to have about a system whereby the society collected their produce from their farms. The other half should write down all the items of information which would be needed to enable members to make use of a system which required them to deliver their crop to a collecting centre.
- 4) Allow trainees fifteen minutes for this. When they have completed their lists, go round the group asking each trainee to mention an item. The lists should include items such as the following:

Society Collecting from Members :

- Date and time of collection.
- Place of collection if not at farm gate.
- Arrangements for notifying members if service breaks down.
- Transport charges.
- *Minimum and maximum loads to be collected.
- *How crop is to be prepared for collection.
- *Any packaging required.
- *Labour needed to assist loading.
- *Time and date when crop will be valued.
- *Price, payment method and date.

Members to Deliver to a Collection Point :

- Dates and hours when deliveries can be made.
- Location of collection point.
- *Minimum and maximum loads accepted.
- *How crop is to be prepared for delivery.
- *Any packaging required.
- *Labour needed to assist unloading.
- *Delay likely before crop is valued.
- *Price, payment method and date.

Discuss any additional or omitted items. Point out that those items which have been starred may already be known to members unless the system is just starting for the first time, but members may need to be reminded and new members may have joined since the last collection.

- 5) Ask trainees individually to write down as many different ways as they can by which a society might provide such information to its members. Allow them up to fifteen minutes for this. Encourage them to write down even apparently foolish suggestions. When they have completed their lists, ask each trainee to suggest one method or "medium" and list all the suggestions on the chalkboard/OHP.

The completed list should include whichever of the following items are locally available:

- Posters.
- Leaflets sent by mail.
- "Stuffers" enclosed with accounts or other regular mailings.
- Radio announcements.
- Newspaper advertisements.
- Journal advertisements.
- General meeting.
Special meeting.
- Committee Meeting.
- Word of mouth through local leaders.
- Visit farmers or go round with loudspeaker mounted on vehicle.

Remind members that information about meetings must itself be communicated if people are to attend.

- 6) Ask trainees what they want to achieve when they communicate with members. Elicit a list such as the following:

- The message can be retained by members for future reference.
- The message can be communicated in some detail.
- The message can be understood by illiterates.
- The message is inexpensively communicated.
- The message reaches large numbers of people.
- The message is rapidly spread around.

Draw a diagram on chalkboard/OHP of the following form and ask trainees whether each of the communication methods they have identified achieves each objective. Mark each box "Y" or "N" as below, but according to trainees' views.

Medium	Can be Retained	In Some Detail	Effective for Illiterates	Inexpensive	Reach Large Numbers	Rapid
Leaflet	Y	Y	N	N	Y	Y
"Stuffer"	Y	Y	N	Y	Y	N
Poster	N	Y	N	N	N	N
Radio	N	N	Y	N	Y	N
Newspaper Advertisement	Y	Y	N	N	N	Y
Journal Advertisement	Y	Y	N	N	N	N
Word of Mouth	N	N	Y	Y	N	N
Call Meeting	N	Y	Y	N	N	N
Committee Meeting	N	Y	Y	Y	N	N

Discuss any differences of opinion, and ask trainees what proportion of their members are illiterate. If they do not know, stress that they must find out, since effective communication is impossible without this information.

- 7) Ask trainees to rank the six objectives mentioned above in decreasing order of importance as they apply to the task of diffusing information about collection arrangements. The ranking will depend on the proportion of illiterates in a society, but if there are a large number of people who cannot read or write the following ranking might be appropriate:

- 1) Understood by Illiterates
- 2) Reach Large Numbers of People
- 3) Rapidly Spread Around
- 4) Can Include Some Detail
- 5) Inexpensive
- 6) Can be Retained for Reference

Ensure that the table in "6" above remains on chalkboard/OAP.

Ask trainees what are the implications of this ranking for the selection of methods of "media" for conveying information about collection arrangements.

Clearly a combination of media is necessary. This might include:

- Word of Mouth
- Committee Meeting
- Leaflet
- Poster

- 8) Tell trainees that they are now to simulate in the classroom the basic weakness of individual word of mouth communication for messages of this sort. Ask for eight volunteers, seven of whom should leave the room. Tell the remaining one a reasonably involved piece of information, such as:

The Society's six ton vehicle will call at members' farms in the south-western sector on the morning of Monday, April 19th, Wednesday, April 21st and Saturday, April 23rd between 10.30 a.m. and 12 noon."

Ask one of the other volunteers to return to the classroom and tell the first volunteer to whisper to him the piece of information he just received. Continue the process through the remaining six volunteers, ensuring that the other trainees remain silent, and that neither they nor the volunteers write anything down. Ask the last trainee to repeat the message to the Instructor.

This message as then received should be compared with the original. It will almost inevitably have been seriously distorted. Any form of communication which relies on word of mouth communication suffers from this disadvantage since mishearing and problems of memorising detail are at least as serious as the problems which have been artificially created in this exercise by asking trainees to whisper to one another.

- 9) There should since the beginning of the session have been no mention of the simulated poster that was then displayed for twenty seconds. Remind trainees of this, ensure that they have no access to any written notes of its content, and ask them what it said.

It is unlikely that more than a very few trainees will have remembered even the outline and most unlikely that any will have recalled the complete message correctly.

Stress that this experience and the previous exercise showed that written and word of mouth communication can easily fail. Both must be carefully designed to achieve their objective.

topic

9

**designing
the communication**

SESSION 9

DESIGNING THE COMMUNICATION

Objective : To enable trainees effectively to convey information about collection arrangements through the written and the spoken word.

Time : One and a half to two hours.

Material : Role Play Briefs "The Careful Cotton Cultivators' Co-operative", parts VIII and IX.

Session Guide :

- 1) Nominate five trainees to act as the Management Committee of the Careful Cotton Cultivators' Co-operative Society and give them their appropriate briefs. Allow them up to 30 minutes in a separate room, to prepare their initial presentation and to make up their list of additional items of information.

Give the remaining trainees each a copy of the Members' Brief. During the 30 minute period they should similarly produce as long a list as possible of questions. The Instructor should in this case monitor the proceedings to ensure that every question is reasonable, and might have been foreseen by the Committee.

If necessary assist this group to ensure that they produce a challenging list. Possible questions might include:

- Who is responsible for providing sacks?
- Who will be responsible for any rain damage to crops which stay unprotected over-night if the transport does not arrive as scheduled?
- How many people are needed to load the crop?
- Can the member travel with the crop to the collection centre?

- Must the member himself be present when the crop is loaded?
- In what size or weight sacks should the crop be packed?
- How should the sacks be marked to avoid confusion with other members' crops?
- What are the maximum and minimum amounts that can be collected?
- What will the farmer receive to show the amount of crop that has been collected?
- What penalty, if any, will be levied if the crop is not ready for collection at the appointed time?
- What arrangements will be made if the crop is wet by rain and the weight is changed?
- What alternative schedule will be followed if bad weather delays collection?
- How will members be notified if changes have to be made in the schedule?
- At what time of day can each member expect the vehicle to arrive and how much leeway should he allow?
- Will pick-ups continue during the lunch hour?
- Where will the vehicle come to if there is no motorable road right up to the farm?
- Who is responsible for paying for the transport?

2) Re-admit the five Management Committee Members. Allow them two minutes for their initial presentation. The Members should then be allowed to put their questions for as long as is necessary to go through them all. Ensure that time is not wasted on discussion. If the Management Committee have not listed the answer to a particular question, they should not be allowed to answer "off the cuff" but should at once go on to the next question. Check that every answer given by the Committee has in fact been taken from their preprepared list. Maintain a "score", crediting one to the Committee for every question they anticipated and one to the Members for every question which they asked that the Management Committee did not foresee.

The Members should also lose one mark for every question which they ask which has already been answered, either in the initial presentation or in the course of answering their questions. The Instructor's decision must be final as to whether questions have or have not been answered, or included in the Management Committee's initial list. It is important not to make an issue of the precise words which are used. What matters is the sense of the information.

Ensure that the main items of information provided by the Management Committee are summarised and remain in view on the chalkboard/OHP for the second half of the session. If any important questions have not been asked or answered by the end of the session, ask the Committee to suggest answers to them and include them in the summary.

- 3) Discuss the conduct of the meeting. Apart from the number of questions which the "Management Committee" were able or were not able to foresee, the discussion should focus on the following:
 - Did the initial presentation immediately attract Members' attention and did it include the most important items in such a way that the listener would be likely to remember them?
 - Did the Committee treat the Members as the owners of the Society whose interest they are employed to serve, or as ignorant and interfering busybodies who should consider themselves fortunate to receive any service at all?
 - Did the Committee answer Members' questions politely and clearly and ensure that the answers were understood or did they give the impression that members were foolish to ask any questions at all?

- 4) Divide trainees into a minimum of eight groups. If numbers do not permit this many, one or more can consist of one person only. Ensure that every trainee is familiar with the information about the Careful Cotton Cultivators' Co-operative Society as already discussed.

Stress that any announcement must attract, interest and motivate. Point out that the initial letters of the words a.i.m. can serve to remind them what the "aim" of an announcement should be.

Allot each group one of the following four tasks. Each task should be done by at least two groups or individuals, and if there are more than eight groups, some can be done by three or more.

- a) Design an A3 size (approximately 42 x 30 centimetres) poster to be displayed in shops, on roadsides and elsewhere in the area to inform members about the collection system.
 - b) Design an A5 size (approximately 21 x 15 centimetres) leaflet to be printed on one side of the paper only and to be distributed by hand or mailed to all members with their monthly statement of account in order to inform them about the collection system.
 - c) Design a 15 centimetres by two column newspaper advertisement to be inserted in the local weekly newspaper which reaches at least 60% of all members. This should similarly inform them about the collection system.
 - d) Write a script for a fifteen second radio announcement to be broadcast on the local radio station which reaches 80% of all members. The message should inform them about the collection system.
- 5) Give trainees working on assignments "a", "b" and "c" pieces of paper of the correct size. If possible display sample advertisements, posters and leaflets to give trainees some idea of the media for which they are designing.

Play a fifteen second snatch of dialogue on a radio or tape recorder to demonstrate the duration of a fifteen second announcement.

Warn trainees that they must:

- Be selective. In all four cases, only a small proportion of all the available information can be included. They must decide what to include and what to leave out.

Design an attractive and interesting announcement. If nobody is attracted to look at or listen to an announcement, the information will never be communicated, and if the content seems uninteresting nobody will remember it.

- 6) Allow up to 45 minutes for the completion of this exercise. Group "a" should be ready to display their posters on the chalkboard. Encourage groups "b" and "c" to prepare their designs for presentation to the class, which should if possible be reproduced on a copying machine for distribution to all participants. If possible group "d" should be given use of a taperecorder.
- 7) Ask each group in turn to present its design. Alternative designs using the same medium should be presented one after the other to facilitate comparison.

Encourage trainees to criticise, compare and suggest improvements. The following questions should be asked about all designs whatever the medium:

- Does the initial impact attract the eye (or the ear) so that in spite of all the other distractions the reader or listener will notice it and decide to read or listen further?
- Does the content interest the reader or listener so that he or she is encouraged to take note of the whole message?
- Does the whole announcement motivate the reader or listener to do something, whether this be to obtain more information or to prepare his crop at a specific time?

It is unlikely that any of the four types of communication would be effective if it included any more than a small part of the total mass of information. Every announcement should therefore include clear information as to where further information can be obtained.

- 8) Discuss and compare the announcements in each medium with particular reference to the following:

a) Poster :

- Does the design include words or illustrations which are sufficiently large and attractive to interest passersby and to be seen and understood from the distance at which such a poster is likely first to be observed?
- Is there so much writing that people will be discouraged from stopping whatever they are doing for long enough time to read it all?
- Posters may last a few hours or many months. Does the poster make it clear to what month or even year it refers?

b) Leaflet :

- Is the immediate message such as to encourage further reading, does it perhaps suggest something more cheerful than the set of accounts it accompanies?
- Is the message timed to coincide appropriately with the date at which regular mailings are made to members?
- Is the message laid out in the form of a checklist or set of instructions to encourage members to keep it for further reference?

c) Newspaper Advertisement :

- Is the design laid out so that it will attract the reader's eye among all the other advertisements and editorial stories surrounding it?
- Is the content at least as interesting and clear as that of other "competitive" items likely to be in the newspaper?
- Is the advertisement designed so that it may be cut out and retained for future reference?

d) Fifteen Second Radio Announcement :

- Is the message timed to occupy the full fifteen seconds when spoken clearly and deliberately?

- Does the initial word or two attract attention and warn the listener that he is about to hear something worth hearing, which will benefit him?
- Does the message attempt to contain so much information that nothing is actually conveyed or will be remembered by the listener?

9) If possible compare trainees' suggestions with examples of similar announcements published by co-operative societies or other organisations.

Stress that anyone attempting to design any form of communication, whether it be a spoken comment, an advertisement or a book, must first of all be clear as to the objective of the communication.

Ask trainees what might be the objectives of the announcements they have just been designing:

- To warn members that a more detailed announcement would be made in the future at a particular time and place.
- To encourage members to contact the Society or its field representatives to obtain detailed information.
- To encourage members actually to prepare their crops for collection at a particular time and place.

These are very different from one another, although they are all part of the same overall communication task. Communication like any other management function will only achieve what its originator intends if its originator knows what he intends.

The Careful Cotton Cultivators' Co-operative - Part VIII

Role play brief: The Management Committee

You have recently completed your plans for the collection of members' cotton crop. Since this is their first crop, it is very important that everything should go smoothly and you have therefore called a meeting for all members to enable them to hear an outline of the system and to ask for any further information they need.

The basic system is as follows:

The Society's vehicle will collect members' cotton from their farms during the week beginning April 19th, 1982. It will collect from members in the south-western zone on April 19th, the south-eastern zone on April 20th and 21st, the north-eastern zone on April 22nd and the north-western zone on April 23rd and 24th.

You anticipate that members will require some further information. You are therefore asked to think of as many other items of information which members might reasonably need to hear, and to make up and write down answers to these expected questions.

The meeting with members will start in 30 minutes; you will have two minutes, and no more, to present what you believe to be the basic information, since members so far have heard nothing. Members will then ask questions and your performance as managers will be judged by the proportion of those questions which you have foreseen and to which you have written down answers in advance.

The Chairman will check your preprepared list as you answer each question; if the basic information is already written down, you will receive one point; if not, the members will receive one point.

The Careful Cotton Cultivators' Co-operative - Part IX

Role play brief: The Members

You will soon be harvesting your first crop of cotton, and the Society's Management Committee has announced that they are holding a meeting to inform members about the arrangements for collecting cotton from their farms. You know that the Society's vehicle will be undertaking the collection, but you have no further information.

You are anxious to test the skill and foresight of your Management Committee as well as to be sure of all the details of the collection system. You should therefore write down a list of as many reasonable questions as you can to which you believe they should have answers prepared in advance.

The Committee will start the meeting with a brief two minute outline of the basic details, and then you will have an opportunity to ask your questions. If they have foreseen the questions and have the answers ready written down, they will receive one point. If they have not foreseen them, the Members will receive one point. If on the other hand you ask a question which has already been answered, even if with different words, you will also lose one point.

The Chairman will be the sole judge of whether questions have indeed been foreseen or not.

bag systems

SESSION 10

BAG SYSTEMS

Objective: To enable trainees to design and operate effective systems for the delivery, recovery and payment of temporary packing materials.

Time: One and a half to two hours.

Session Guide:

- 1) Trainees may themselves be dealing with a crop such as sugar cane or rice paddy which requires no packing for its journey from the farm to the initial processing operation. In many cases, however, packing is important for agricultural marketing co-operatives, and frequently a cause of excessive costs and member discontent. Trainees should therefore be exposed to the problems and opportunities involved.

Stress that systems for handling temporary packing materials are for convenience known as "bag systems". The packing need not necessarily be bags, but may be milk churns, cartons, crates or many other forms of container.

- 2) Select one or more appropriate local crops which can be packaged in various ways and ask trainees to write down all the different ways in which they might be packaged for their journey between the farm and the collection centre. Their answers will of course depend on the crop selected, but examples might be as follows:

Potatoes

- One-trip paper sacks.
- Reusable jute sacks.
- Plastic tubs.
- Tractor trailers left on the farm.
- Wooden crates.
- Cardboard cartons.
- Loose and unpacked.

Liquid Latex

- Bulk tank trailers.
- Metal cans.
- Buckets.
- Trailer-borne drums.

Milk

- Churns.
- Plastic bags.
- Buckets.
- Bulk tanker trucks.
- Glass bottles.
- "Calabashes" (dried hollowed-out gourds).

Maize

- Jute, sisal, plastic, polypropylene, cotton
- Baskets.
- Open topped drums.
- Waggons, lorries or trailers.
- Bulk tankers with pneumatic loading and unloading.

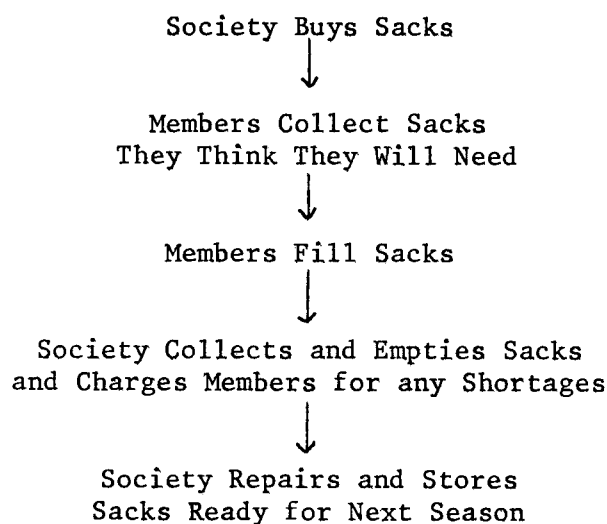
3) It may be difficult to select an appropriate form of packing for members' crops. Ask trainees what factors should be taken into account when selecting a particular type of packing to contain members' crops for their journey from the farms:

- The amount of crop on each farm.
- The type of crop.
- The length of the journey.
- The type of transport.
- The likely delay before and after transport.
- The handling equipment available to the farmer.
- The handling equipment installed at the collecting centre.
- The funds available.

4) The choice of a method of packaging is a technical and economic problem, and must be made individually by every society in co-ordination with whatever other organisations may be involved in handling the packaged produce.

This session is primarily concerned with the management of whatever form of packaging has been selected.

Demonstrate how a bag system can be illustrated by a simple diagram.
Use the following example:



This is not meant to illustrate any particular system, but to show the kind of diagram that should be used in the following exercise.

Divide trainees into groups of up to five members each. Ask them to complete the following assignment which may be distributed in writing or displayed on chalkboard or flipchart:

"Draw a diagram showing how your society now organises the purchase, issuing, recovery, payment, repair and storage of bags (or other containers). Draw another diagram showing how the present system might be improved, and prepare to present and explain this to the class."

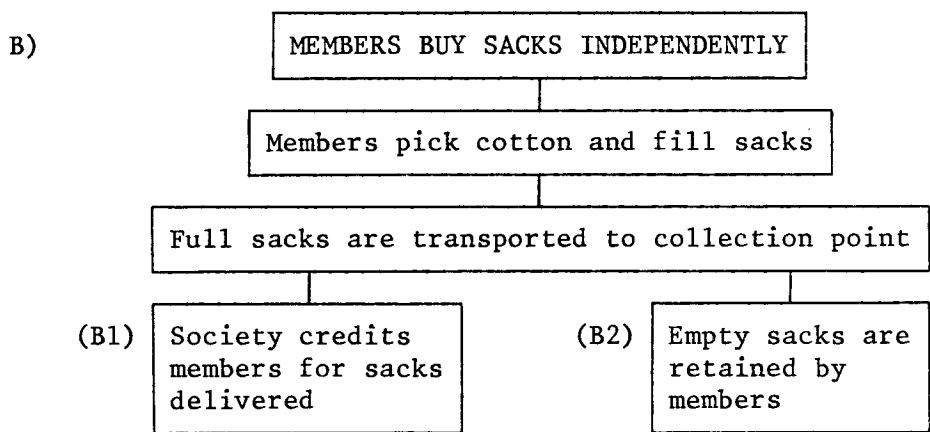
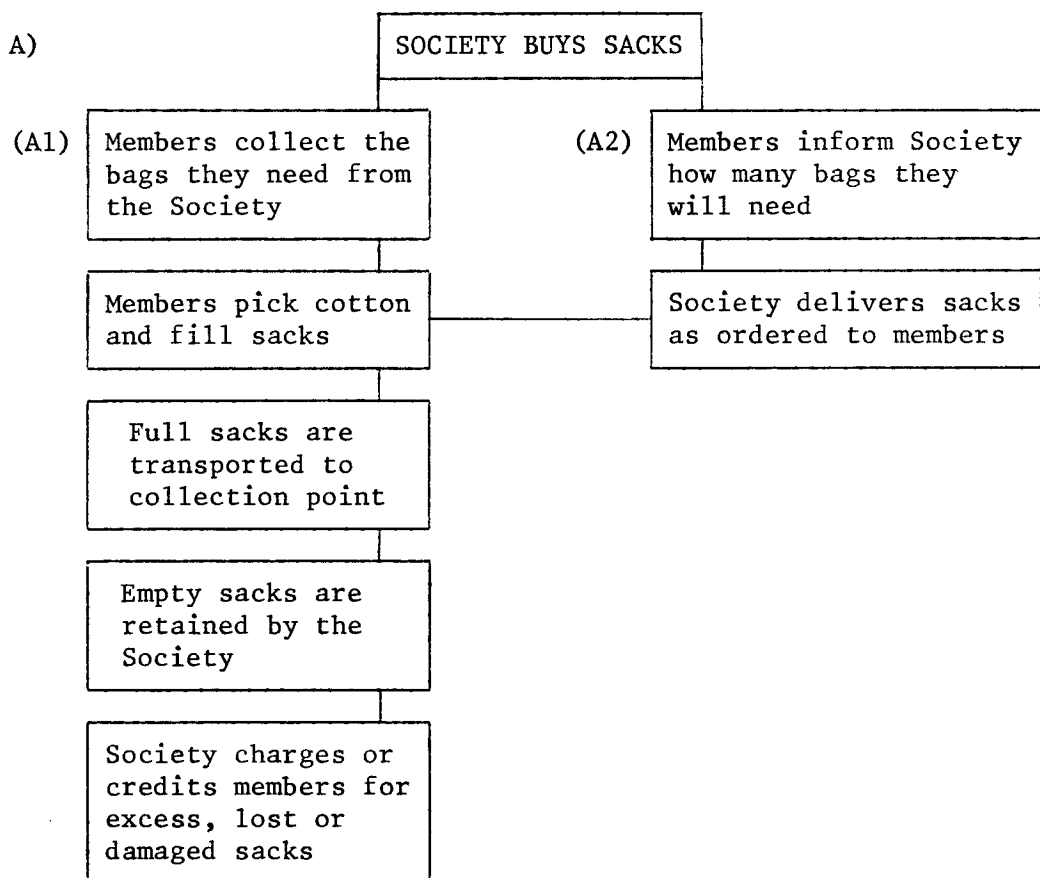
Leave the assignment displayed on the board. Allow trainees up to 45 minutes to complete it and circulate among the groups ensuring that:

- Trainees are not ignoring the possibility that the society itself need not ever buy or own the sacks.
- Trainees are using reasonably clear and consistent forms of diagram to illustrate their ideas.
- Trainees are able to prepare illustrations of their diagrams on flipchart sheets for later presentation to the rest of the trainees.

- 5) Reconvene the class. Ask representatives of each group to present one alternative in turn, and go round the groups more than once if necessary

until every different alternative has been explained. Each should be diagrammatically illustrated and the diagrams should remain on display for the remainder of the session.

The following possibilities are based on the Careful Cotton Cultivators' Co-operative case study used in earlier sessions. They illustrate some of the alternatives that are possible.



C) As "B" but members buy sacks from the Society, cost (possibly subsidised) is debited on members' accounts and credited on return

of sacks. No money changes hands unless the members return more or less than they originally purchased.

6) When all reasonable alternatives have been presented, ask trainees to mention examples of problems that may arise with bag systems of any kind. Elicit suggestions such as the following:

- Non-standard size sacks confuse measurement of volume.
- Members have insufficient sacks.
- Members keep sacks for their own use or resale.
- Sub-standard sacks lead to loss of produce.
- Members have lengthy and unresolved disputes over credits or charges for sacks, because of failure to agree on quantities or damage.
- Small unresolved disputed charges delay settlement of far larger debts.
- Sacks deteriorate in storage and have to be replaced at great expense.
- Members cannot afford to buy sacks for their crops before receiving payment for the crop.

7) Ask trainees to suggest which of the problems they have identified are most likely to occur with which of the alternative systems they have suggested.

Ask trainees which type of system appears to have the least number of problems.

Their answers will obviously depend on local circumstances, but stress that wherever possible members should themselves be responsible for buying, storing and recovering sacks. This avoids a great deal of wasted administrative time and petty accounting and disputes, as well as the actual cost of the sacks and the storage and maintenance of them. Minor tasks of this type can more efficiently be carried out by members themselves rather than as an irritating sideline to the main marketing activity of a co-operative.

Ask trainees how a society can make it easier for members to organise their own initial packaging:

- The Society can identify and suggest appropriate sources of supply for the correct size and type of bag, and may be able to negotiate a special discount or credit arrangement on behalf of members. The Society should not however take any formal responsibility for this.
- The Society can add whatever sum is necessary to buy bags to members' normal seasonal credit loans, to be repaid from crop receipts without special reference to the bags as such.
- The Society can arrange for simple weighing equipment to be available on each collection vehicle, so that all sacks can be weighed when loading and non-standard sizes will not cause any problem.
- The Society can ensure that all produce is received, weighed and graded as soon as it is delivered to the collection centre, so members can recover their sacks without having to make a further special visit.

Ask trainees whether their societies help their members in this way. Improved management and administration of this sort can make a greater contribution to the solution of bag problems than any complete system which a society may care to design and operate for its members.

topic

11

designing
the reception system

SESSION 11

DESIGNING THE RECEPTION SYSTEM

Objective: To enable trainees to design, to staff and physically to lay out an effective crop reception system.

Time: Two to three hours.

Material: Case study, "The Three Crops", Parts I and II.

Session Guide:

- 1) Give one trainee ten different size sheets of paper and a suitable envelope. Ask him or her to fold each of the sheets separately in such a way that it neatly fits into the envelope, and to insert all the ten folded sheets into the envelope.

Ask the remaining trainees to time the operation which should take about 30 seconds.

Ask trainees how they would organise such a task if twenty of them had 10,000 sheets of paper to fold and insert in 1,000 envelopes:

- Each of the twenty could take 500 sheets and 50 envelopes and do the whole job.
- They could divide up the task so that each trainee specialised on folding one size of sheet, or on inserting and sealing the envelopes.

Ask trainees why they might prefer to divide routine tasks of this type into specialised functions:

- Individual operators could learn how to complete one task very efficiently.
- People can be allotted to tasks for which their ability and preference qualify them.

- If any equipment is required this can be kept to a minimum since whatever tool or machine that is needed can be used continually by one person rather than having to be issued to every operator.
- If it is necessary for whatever is being processed to move through the various stages, the operators can remain in the same place and pass the material from one to another. This may take less time and space than if the operators themselves moved from station to station.

2) Ask a trainee to divide up the operations involved in receiving his or her members' crops into individual tasks that can be performed by one person. Is the reception task actually divided up and allocated to specialists in this way, or does each member of the reception team carry out every handling, checking, recording and payment function for one member's produce?

Unless there are only one or two tasks, or one or two people doing the whole job, it is normal to divide up the tasks between a number of different people.

Ask trainees to reconsider the initial task of folding paper and putting it in an envelope. When one trainee was doing the whole job, was he fully occupied throughout?

If one trainee had folded the paper and another had inserted them in envelopes, what problem would have arisen, and how could it have been solved?

- The folding would take far longer than the inserting, and the inserter would be idle for much of the time.
- The job could be timed and divided into two equal halves, or the folding task could be divided between a sufficient number of different operators so that it took each one the same time as the insertion task took.

3) Divide trainees into groups not exceeding four members and distribute Case Study Part I. Allow groups up to 45 minutes to complete the

three exercises. If there is not enough time, they should only do the exercise which is closest to the crop with which they are familiar.

- 4) Reconvene the class and ask each group in turn to state how they propose to man the wheat reception line. Discuss and compare their different conclusions. The following is a reasonable solution which may be compared on the chalkboard/OHP with those suggested by trainees:

Wheat:

Task	Number of Operators	Theoretical Capacity Per Day
Visual Inspection } Moisture Content Test }	1	96 Batches
Spectrometer Protein Content Test	1	96 Batches
Gluten Content Test	4	96 Batches
Weighing } Taring }	1*	320 Batches
Calculating	1	120 Batches
Payment	1	96 Batches
Total Number of Operators	9	

*The Weighing and Taring Operator could also assist with general labour or might be the System Supervisor.

Trainees may object that the expected daily output from an inspector carrying out a five minute operation is 96 batches per day. Point out that a line of this sort should improve its performance with practice and the individual estimates are only approximate. Once such a line starts to work it should substantially improve on the times which were recorded on an experimental basis.

- 5) Ask syndicates to present their answers to the problem of the Orange and the Green Bean Growers. Possible solutions are as follows:

Oranges:

Task	Number of Operators	Theoretical Capacity Per Day
Wash } Rinse }	3 People Team	12 Tons
Wax } Dry }	2 People Team	10 Tons
Grade	5 People Team	10 Tons
Size } Pack }	3 People Team	10 Tons
Total	13 People	

Green Beans:

Task	Number of Operators	Theoretical Capacity Per Day
Visual Check	1 Person	108 Batches
Snapping Test } Dimension Check }	2 People	154 Batches
Clean } Weigh } Tare }	1 Person	90 Batches
Packing	1 Person	90 Batches
Calculating	1 Person	135 Batches
Payment	1 Person	108 Batches
Total Number of Operators	7 People	

Trainees should observe that the Visual Inspector has at least as much, or preferably, rather more capacity than any other:

- Because some batches are rejected after initial inspection, this Inspector has to deal with rather more batches than most.
- Arguments and disagreements are likely at this stage and may take some time.

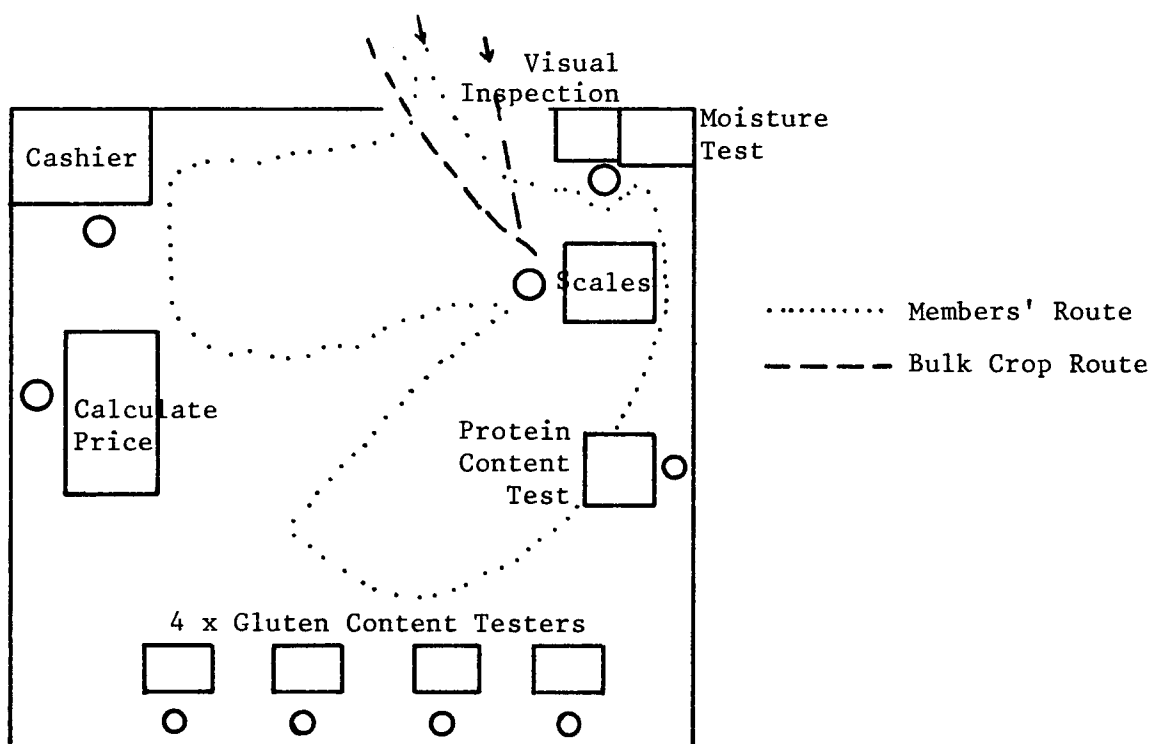
The calculation and payment stages should also if possible have excessive rather than insufficient capacity for the same reason.

Point out that the sequence of operations is often flexible. An initial visual check must usually come first, and all inspection operations must be completed before weighing, calculation and payment, but the sequence of inspection tests themselves can sometimes be changed.

Stress that more than one sample testing operation can take place at the same time. This reduces the amount of time taken to receive members' crops even if it does not reduce the number of inspection staff who are necessary.

- 6) Divide the class into the same groups as before and distribute Case Study Part II. Allow up to 45 minutes for completion of plans. If time is insufficient, each group need only do one of the plans. Groups should prepare OHP or flip-chart sheets for their presentation to the rest of the trainees, and the case study plans should also be reproduced on chalkboard/OHP or flip-chart to facilitate comparison with groups' recommendations.

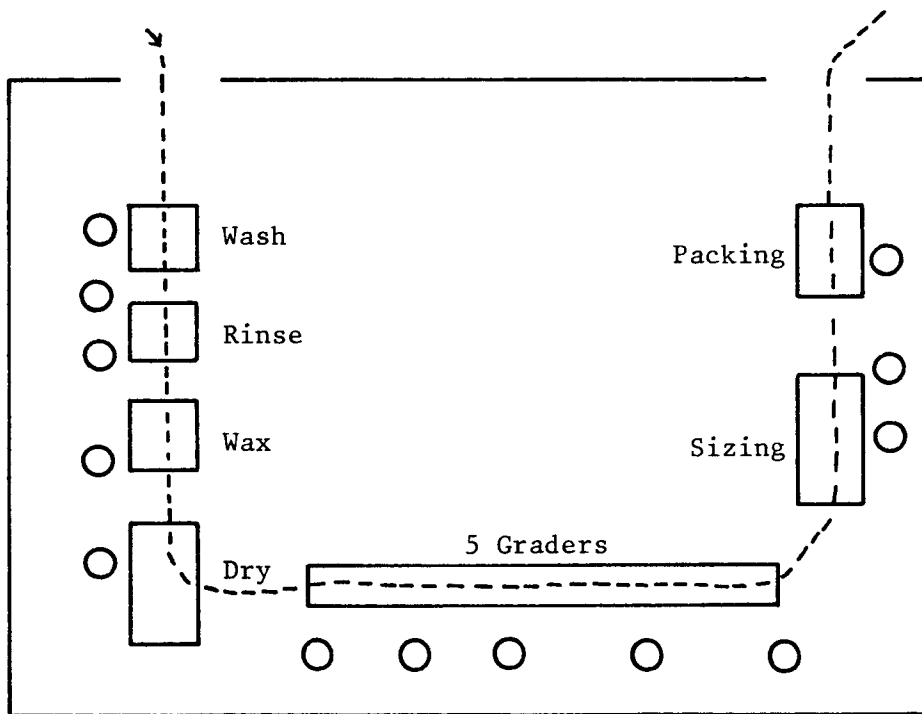
- 7) Reconvene the class and ask each group in turn to present its plans for the Wheat Reception System. One possibility is shown below:



Draw lines as on the above illustration to show the movement of the member and of his crop. Stress the following points of contrast between this and the case study solution.

- The movement of the actual wheat is minimised, since only samples need pass through the protein, moisture and gluten content tests.
- The members' movements are approximately circular, which avoids excessive movement and confusion.
- The payment desk is securely located in a corner to minimise the danger of theft.

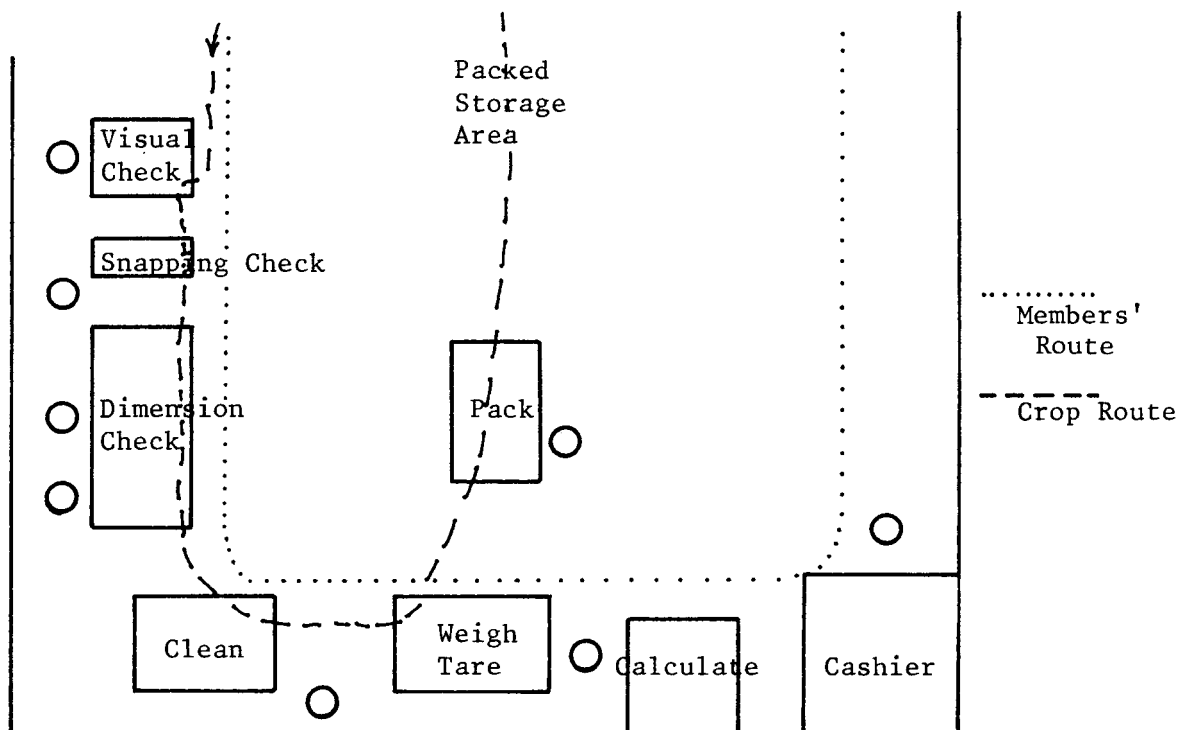
8) Ask each syndicate to present its layout for the Orange Reception Centre. One possibility is shown below:



Trainees should note that this is a processing operation. Since weighing, calculation and payment are done elsewhere, there is no need for members to be able to follow their crop through the various operations.

9) Ask groups to present their layout for the Green Bean Reception and Packing Station.

This combines the functions of reception and payment with simple processing for export. It is essential that members should be able to accompany "their" crop until it has been graded, weighed and agreed. Thereafter they need not have regular access to the process. One possibility is shown below:



Trainees should notice:

- Members are separated from their crop as soon as it has been inspected and weighed.
- Cleaning, calculating and payment are as far as possible from the open side to avoid wind, rain and dust, and to assist security.

10) If time allows invite one or more trainees to draw a diagram of his or her crop reception layout. Other trainees should comment on this and make suggestions for improvement.

The Three Crops - Part I

You are a Consultant to the Co-operative Movement on organisation and methods. The Produce Purchasing Managers of three co-operative societies, producing wheat and oranges and green beans for export, have asked you to help them design their respective crop reception systems.

You asked them in turn each to provide you with information about their expected daily throughput, the hours worked per day and the different processes involved in the crop reception process. You asked each Manager to find out how long one operator would take to complete each stage, using whatever equipment was necessary. Their replies can be summarised as follows:

The Wheat Society

Expected Throughput = 100 batches, each containing
an average of 10 bags.

Hours Worked = 8 hours per day.

Process:

Task	Time Taken by One Operator
	Minutes Per Batch
Initial Visual Inspection	2
Sample Moisture Check	3
Sample Spectrographic Protein Content Test	5
Sample Gluten Content Test	20
Weighing Bulk Crop	1
Taring by Weighing Empty Bags	$\frac{1}{2}$
Calculating Price to Be Paid	4
Paying Each Member	5

The Orange Growers' Society

members' fruit was weighed when collected from the farms, and the necessary entries were made in their accounts from the weighing notes. The Processing Manager was therefore concerned about the organisation of the processing, grading and packing system, and not about members' payments.

Throughput = 10 tons per day
 Hours Worked = 10 hours per day

Process:

Washing - 1 Operator could complete 8 tons per day.
 Rinsing - " " " " 8 " " "
 Waxing - " " " " 12 " " "
 Drying " " " " " " " "
 Grading - " " " " 2 " " "
 Sizing " " " " " " " "
 Packing - " " " " " " " "

The Green Bean Society

Daily Throughput = 100 Batches. Hours Worked Per Day = 9.

Using one operator for each operation the following number of batches could be completed per hour:

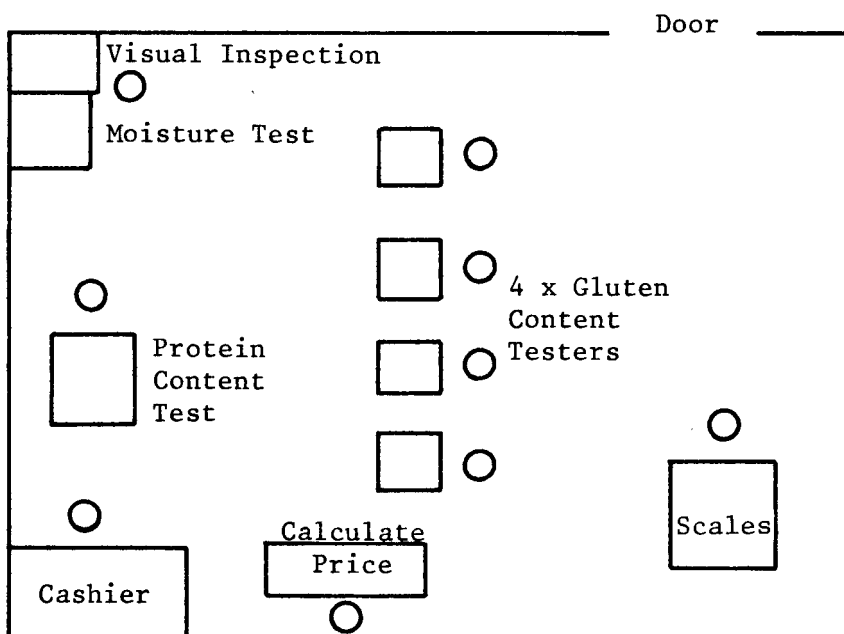
Operation	Number of Batches
Initial Visual Inspection	12
Sample Snapping Check	60
Dimension Check	10
Cleaning	20
Weighing	30
Taring	60
Packing	30
Calculating Price	15
Paying - One Operator could deal with 12 Members per hour.	

You are required to work out and recommend to each Society how many people they should assign to the crop collection task, and how the individual stages in the process should be allocated among the team. Your objective is to design a system which will deal with the expected throughput as smoothly as possible, with minimum delays between the stages and with as few staff as possible.

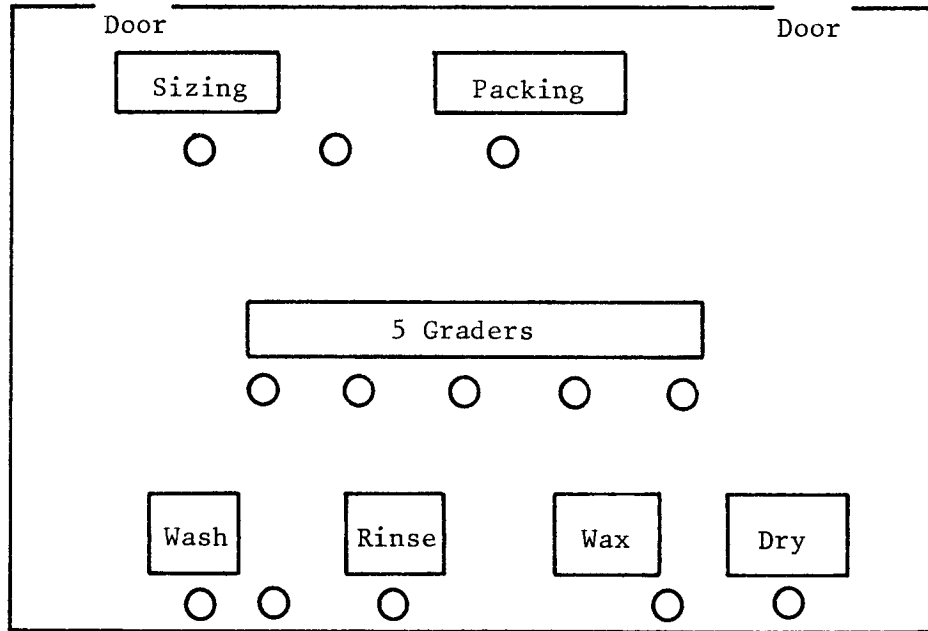
The Three Crops - Part II

You sent your recommendations to the Crop Processing Managers of the three societies, and you understand that they followed your advice. At the end of their respective harvest seasons, however, they all contacted you to express their disappointment. Apparently the solutions you recommended did not work as well as you and they had hoped. There was a great deal of congestion and confusion in the crop reception centres, and this slowed down the whole receiving process very seriously. Since the harvest season was in every case only just completed, you visited each one of the societies in order to see for yourself the actual facilities which had been used. You made a simple sketch plan of each centre, showing the location of the process and of the people operating it, and these are reproduced below:

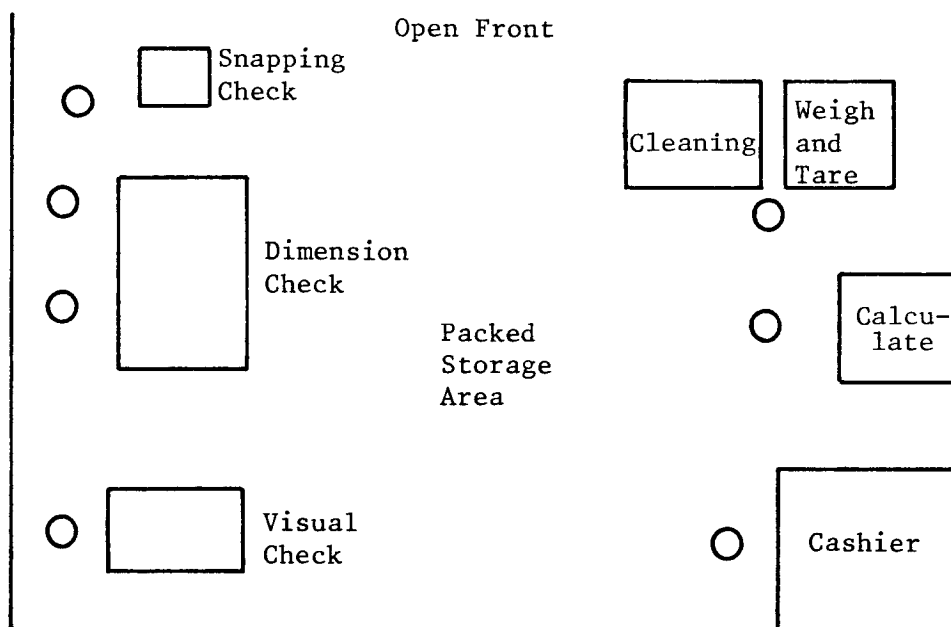
The Wheat Society



The Orange Growers' Society



The Green Bean Society



The Purchasing Managers asked you to suggest how they might improve the physical layout of the centres next season, in order to avoid delays and congestion. Since the harvest season only lasted a few weeks in each case, the system had to be set up anew each year. The buildings could not be changed in any way and you marked the tables and other pieces of equipment more or less to scale. Your task is to examine the present arrangements and to prepare a plan for a new layout if you feel that any changes should be made.

topic

12

queueing

SESSION 12

QUEUEING

Objective: To enable trainees economically to minimise members' waiting time at reception centres.

Time: One and a half to two hours.

Material: Case study "The Welfare Wheat Growers' Society".

Session Guide:

- 1) Remind trainees of the queues, or disorganised groups of people, who are often to be seen at bus stops. Ask trainees why such queues develop.

Trainees will probably blame the shortage of buses, vehicle breakdowns or delays. Ask them whether people often wait all night at a bus stop, or whether many people are prevented from making their intended journeys at all. It should be clear that they are not.

Lead trainees to the conclusion that there are two fundamental causes for queues:

- People expect that there will be a shortage, even if it is only of a bus at their preferred time.
- The demand for and the supply of the service do not occur at the same time. People arrive at the bus stop fairly steadily, but the buses leave only at intervals, whether these are predictable or not.

Queues are a linking device or buffer between two activities that take place at different intervals.

Ask trainees whether they like to queue or to obtain goods or services without delay. Clearly they prefer immediate service.

- 2) Ask trainees whether members ever have to wait to deliver their crops. Do they as managers prefer to see a long line of members or just one or two waiting to deliver their crops. What are the advantages of each situation and which is more economical?

A Long Queue

- A comforting indication to management that members are delivering their crops at the right time.
- Receiving staff and facilities will be fully occupied and will not have to wait for members to arrive.
- Members who wish to delay or dispute inspection decisions will be discouraged by those still waiting to be served.

No Queue

- Members will be more satisfied with the Society's service.

Trainees will probably argue that a queue is more efficient, since facilities are fully employed. Remind them of Session 3 and ask what extra costs are involved if members are kept waiting:

- Members' goodwill is lost.
- Members spend time waiting which could (possibly) have been more profitably employed.

- 3) Ask trainees how they might measure the cost of queueing:

- What is the average waiting time per member? (Say 2 hours)
- What is the average casual labour wage? (Say \$5 per 8 hours)
- How many members are there? (Say 400)
- Cost of waiting = \$500. $\left(\frac{2 \text{ hours} \times 400 \text{ members} \times \$5}{8 \text{ hours}} \right)$

Ask trainees to compare this with estimates of the cost and numbers for their own societies. It is clearly worth some effort to reduce waiting time.

- 4) Distribute copies of the case study or display a summary of the problem on chalkboard/OHP. Allow trainees up to 30 minutes individually to work out the answer and circulate among them to guide those who appear to have no idea where to begin.
- 5) Start discussion by asking trainees to suggest what might have been the Manager's basic mistake. If none of them appreciate the error, ask them the following questions:
 - How many members' deliveries were completed in the first 30 minutes? (One)
 - How many members' deliveries could be started to be processed in the 30 minutes before the lunch break, if the processing line had to be empty by lunch time. (Nil)
 - How many members' deliveries were completed in the first 30 minutes after the lunch break? (One)
 - How many members' deliveries could be started to be processed in the 30 minutes before the end of the day if the line had to be empty by the end of the day? (Nil)

The total daily capacity of the system is therefore not 216 per day but 194 per day.

Stress that the capacity operating rate of a system is not the same as the volume that can be processed in a given period, because the "pipeline" must be filled again after each time the system is emptied.

This system operates for nine hours and the Manager's estimate of continuous throughput during nine hours is correct at 216 members.

The actual volume achieved is only 194, because of the need to empty and refill the system both at the beginning and end of the day and before and after the lunch break.

- 6) Ask trainees what the Manager should have done instead:

- He could have organised six days working, to achieve six times 194 = 1,164 throughput.
- He could have made arrangements for some reception staff and those members whose crops were in process to remain in the processing area during the lunch break and thus have avoided the need to empty and refill the system in the middle of the day. This would have increased throughput by five times eleven or 55 members per week.
- He could have halved the lunch hour or added a further half hour working in the morning or evening by starting at 7.00 a.m. or finishing at 6.30 p.m. This would have increased capacity by a further 60 members per week.

Stress the advantages of avoiding emptying and refilling the system instead of longer working hours, since wages probably need not be increased.

7) Ask trainees how the Manager could have reduced the effect of his mistake once crop receiving had started. How can any co-operative manager ensure that receiving procedures operate as effectively as possible?

- He should have been present when the reception centre opened and when it closed. He would then have realised that only one member would be completed during the first 30 minutes of operation.
- Any manager should be present or immediately available as much as possible during the period when members' crops are being delivered. If this only occurs at occasional intervals through the year, the manager should be present and involved throughout since this is the most important part of the co-operative's activities from the members' point of view.

8) Ask trainees what kinds of produce would be even more seriously affected by the need to "refill the pipeline" of a reception system:

- Meat, where grading cannot take place until animals have been washed, slaughtered, skinned and butchered. This may take several hours.
- Sugar cane, if sucrose content of individual member's consignments must be measured.

Ask trainees to estimate the total processing time for receiving crops with which they are involved. If any are 30 minutes or more, ask whether and how they deal with the problem.

9) Refer back to trainees' earlier estimates of average queueing time necessary to deliver produce to their societies. Ask for suggestions as to how this might be reduced:

- Improve planning and information, so that members are told exactly when to arrive.
- Careful analysis of processing time, including refilling the pipeline, and adaptation of hours accordingly.
- Arrangement of reception times to suit members' travel delays or other factors, reducing the need for a "buffer" between demand for and supply of the reception service.
- The use of numbered position tickets, whereby members are issued when they arrive with a numbered ticket and an estimate of the time when they will be served. They are then free to go and conduct other business until the specified time.
- Constant supervision of reception systems so that problems can be observed as soon as they start or occur and can thus be corrected.

If time allows, ask one or more trainees to describe their own reception systems and queueing problems. Invite suggestions from others as to how delays might be reduced.

The Welfare Wheat Growers' Society

The Manager of the Welfare Wheat Growers' Society was determined to complete the reception of all the 1,000 members' crops in one five-day week. This would save labour and would ensure that every member had the chance to deliver his crop when it was in peak condition. This would be in everybody's interest.

The Manager then carried out a careful analysis of the necessary operations. He carefully timed every stage and obtained the following results:

- Initial Visual Inspection: 22 minutes average per member.
- Moisture Content Testing: 22 minutes average per member.
- Gluten Content Test: 15 minutes average per member.
- Weighing: 5 minutes average per member.
- Calculation and Payment: 5 minutes average per member.

Fortunately the only expensive piece of equipment required was the moisture-ometer. The small hand-mills and viscosity timing funnels for the gluten tests were quite inexpensive and the Society had several spare sets of weighing scales.

The Manager therefore organised the operation as follows:

- 1 Visual Inspector
- 1 Moisturometer Tester
- 6 Gluten Content Inspectors
- 2 Weighers
- 2 Calculation and Payment Clerks

He calculated that this labour force would avoid any bottlenecks. Members samples could pass smoothly from one operation to the next without delay. The system could deal with one member every two and a half minutes, and all the necessary staff would be fully occupied at all times.

The Manager succeeded in persuading the workers to accept the arrangement, with a generous bonus to reward them for the fast pace that would be needed. They agreed to work from 7.30 a.m. to 6.00 p.m., with fifteen minutes break

in the morning and afternoon and one hour for lunch. Members whose crops were being processed would remain in the receiving shed along with one or more of the reception staff, during the morning and afternoon break. It was necessary, however, to clear the line completely before the lunch break as members would not be willing to wait for an hour while the inspection staff took their lunch.

The Manager calculated that the system he had designed would complete the processing of one member's crop every two and a half minutes and would thus complete 24 an hour or 216 every nine hour working day. Five days would cover 1,080 members. The Manager concluded that a safety margin of 80 was more than enough and was confident that all the 1,000 members would be able to be dealt with in the planned period of five days.

In order to minimise member waiting time, the Manager issued a list of reception times, showing which village should arrive at which time. He knew that not every member would adhere to this timetable, but he was sure that the load on the reception system would be fairly level. He described the plan to the Committee and they enthusiastically accepted it and congratulated the Manager on his skill in solving the problem of inefficient reception arrangements which had beset the Society for so long.

The Manager visited the reception centre around the middle of the morning and the afternoon of the first day, and was pleased to see that the individual processes were taking about exactly the amount of time he had estimated. Members were entering and leaving the centre about every two and a half minutes, as planned, and he was confident that the scheme was a success. At the end of the day he was disappointed to find that only about 190 members had been dealt with, instead of the estimated 216 or thereabouts, but he concluded that "running in" problems must have caused some delays.

The second day was no better, however, and some 40 members had to stay overnight because the centre closed before they were dealt with. The Manager had to go to a seminar in the capital city for the rest of the week. When he returned at the beginning of the following week he found that the Society was in an uproar. About 50 members had not succeeded in delivering their crops at all, although many had waited all night. The graders and other

inspection staff had only been hired for five days, and had left, while some of the grading tables and viscosity measuring sets had also been taken back to the other societies from whom they had been borrowed. Nobody had been willing to take responsibility for prolonging the reception period in the manager's absence. Most of the disappointed members had sold their crops for lower prices to private traders, while others had left their wheat in bags outside the Society's office, exposed to rain and dirt from passing cars.

The Manager eventually arranged some temporary facilities and the remaining batches of wheat were processed. The Society had to accept some with excessive moisture content, and they also had to compensate those members who had sold to private traders at a loss. The Manager could not understand what he had done wrong.

Assignment :

- 1) What basic mistake had the Manager made when designing the system?
- 2) How should the system have been designed?
- 3) Once the fault in the system had become apparent when it started to operate, what should the Manager have done to mitigate its effects?

sampling

SESSION 13

SAMPLING

Objective : To enable trainees to select samples of an appropriate size and kind in order to achieve a desired level of confidence in the results they indicate for the whole crop.

Time : Two to three hours.

Material : Case study "The Maize Farmers' Society", parts I and II. If possible, trainees should be given or lent calculators for this session.

Session Guide :

- 1) Ask trainees to mention some crop inspection and quality control operations with which they are familiar. Examples might include:
 - "Candleing" eggs to see if they are fertile.
 - Visually examining fruit for surface blemishes.
 - Measuring the sucrose content of sugar cane.
 - Gluten content measurement for wheat.
 - Measuring moisture content of maize with a moisturometer.

- 2) Ask trainees whether all or only a part of the crops their members supply are subjected to the tests. In what circumstances do they inspect 100% of what is delivered?
 - When the inspection process is cheap and quick.
(e.g. Passing fruit, tomatoes or potatoes over a screen to eliminate undersize items)
 - When even an isolated sub-standard item would be very serious.
(e.g. Withered flowers or bad eggs)
 - When the sampling operation does not damage what is being sampled.
(e.g. Visual inspection techniques)

When is it possible or economic only to examine a part of what has been delivered?

- Some inspection techniques involve expensive machinery and/or specially trained staff, or can be very slow.
(e.g. Moisture content testing of grain)
- It may not be too serious if a small proportion of the crop does not conform to a particular quality standard.
(e.g. The butterfat content of milk)
- The testing itself may destroy what has been tested.
(e.g. Germination proportion testing of seed corn)

3) Point out that whenever anything less than 100% of a crop is subjected to a particular form of inspection, the inspector is implicitly assuming that what is true of the proportion that is inspected is also likely to be true of the remainder.

Ask trainees what conditions must be fulfilled for this to be so;

- The small number, or the sample, must be properly selected.
- The size of the sample must be sufficient for the degree of accuracy that is required.

Ask trainees who are responsible for crop inspection on a sample basis how they select the samples they inspect. Do they carry out any form of calculation, do they follow rules which have been given to them, or do they simply take out whatever they decide is convenient?

There are rules for sample selection which can measure the chances that a given sample is representative of the total from which it has been taken, so that decisions on sample size can be made on a rational basis.

4) Ask trainees to imagine that a member has delivered twenty sacks of maize. They have to take a small sample from any one bag for some form of test, and they have no reason to believe that any of the bags are any better or worse than the others. How will they decide which bag to take the sample from?

- If they take it from the first bag, it may have been carefully prepared by the member.
- If they always select the tenth, the last or any other particular bag, members will come to know this and may conceal sub-standard maize or dirt in other bags.
- They should select a bag at random so that any of the bags has an equal chance of being chosen. They can do this by drawing a number at random from a box, pointing at a table of random numbers without looking, or merely selecting "at random", without any assistance. The test of randomness is whether any one bag has a greater chance of being selected than any other.

How will they decide from which part of the chosen bag to draw the sample?

- Here again, the selection should be random, to avoid always drawing from a particular part which might tend to be of higher quality, (because the farmer puts the best maize on top) or lower quality (because the last sweepings tend to be put on the top of the sack).

5) Ask trainees how they would select a sample of 100 grams from a second farmer, who has three separate plots and delivers twenty sacks from one, 30 from another and 50 from the third:

- Since there may be some difference in the quality of maize from each farm, the sample should be "stratified". It should be made up of kernels from all three plots, in the proportion of 20, 30 and 50, so that each is represented in the same proportion as in the whole delivery.

6) Show trainees how larger samples increase the likelihood that the result from the sample will accurately indicate the result for the whole group.

Select a random sample of about one tenth of the trainees. Note down on the chalkboard how many are male and how many female, how many are left and how many right-handed, how many are or are not married or some similar characteristics.

Select a further sample of about one fifth of the total group and carry out the same exercise. Do the same with a sample of one half of the group.

Finally find out how many of the whole group are or are not male or female, married or single and so on. Write down the results on the chalkboard in the following form:

Characteristic	One Tenth Sample %	One Fifth Sample %	One Half Sample %	Whole Group %
Male				
Female				
Married				
Single				
Left-Handed				
Right-Handed				

The results should show greater similarity to the group as a whole as the size of the sample increases.

This exercise can also be used to demonstrate the importance of random samples. If the trainees selected for the sample are all sitting together, rather than scattered, the result may be distorted because women tend to sit together, for instance. Show how similar errors can arise if samples or bags of produce are not randomly selected.

Ask trainees how they decide how large a sample to take when inspecting members' crops. What factors must they take into account?

- The cost of inspection (including time of staff and the member).
- The amount of variety likely to be experienced.
- The need for accuracy.

Do they in any way quantify these factors, or is the sample size a matter of custom or charts?

(Trainees who have studied statistics may at this point recognise that they are dealing with standard deviations and sampling errors. The vast majority of people who study statistics never make any practical use of what they learn. Ask trainees who have had training in statistics to give examples of any occasion when they

have been able to apply what they learnt, and ask them to help explain what follows to their fellow trainees.)

7) Distribute or display a summary of the first case study. Allow trainees up to ten minutes to think about the problem. Temporarily exclude trainees with knowledge of statistics from the discussion, and ask one of the remainder how he or she might go about solving the problem:

- It is clear to most people, even without any knowledge of statistics, that if two batches out of ten achieve a germination percentage of 98% only, it is at least possible that some from a larger batch will be 97.9% or under and will thus not pass the Government's standard.

Ask trainees how the Manager could be completely sure that all the seed that he delivers can be of the minimum quality standard:

- He could only do this by planting every seed and measuring the germination percentage. This would be impossible and would in any case mean that there was no seed left to sell.

How could the Manager be sure that at least a sample from every batch would be of the requisite standard?

- He could test 100 seeds from every single batch.

Why would this not be practical?

- The cost would be \$10,000 whereas the maximum penalty is only \$1,000.

Remind trainees of the factors mentioned in "6" above. Would trainees feel more confident if all the batches tested had come out at 98.2%?

- The degree of variation from the mean, as well as the location of the mean, is critical to the reliability of the sample as an indicator of the whole.

Ask trainees how they might measure the degree of variation. What is the arithmetic mean or average?

- Total of All Results = 984.8%
Number of Results = 10
Average result = 98.48% or 98.5 rounded to the nearest 0.1

Ask trainees to list the amounts by which each batch differed from this mean:

0.3, 0, 0.2, 0.1, 0.4, 0.4, 0.5, 0.3, 0.2, 0.

Stress that it is unnecessary to record whether each difference was above or below the mean, since the mean itself takes account of this.

Point out that the most accurate measure of the deviation from the mean is called the "standard deviation", and is found by adding the squares of the individual deviations, and dividing the total by the number of units in the sample and then finding the square root of the result. It is unnecessary to go into the mathematical reasons for this, but trainees may care to remember the formula:

- Standard deviation = square root of the sum of the squares of the individual deviations from the mean, divided by the number of items in the sample.

Ask trainees to work out the standard deviation for the seed maize sample from the Maize Farmers' Society:

- The squares of the individual deviations are: $0.09 + 0 + 0.04 + 0.01 + 0.16 + 0.16 + 0.25 + 0.09 + 0.04 = 0.84$
- We divide this by the number of batches: $0.84 \div 10 = 0.084$
- The square root of 0.084 is 0.29 (rounded to the nearest 0.01).

- 8) The standard deviation is a measure of the amount by which the values of the sample differ from the mean of the sample. It is now necessary to find out how likely it is that what is true for the sample is also true for the rest of the seed which was not tested.

The Manager needs to know how likely it is that the results for the sample will be the same for the whole crop.

Trainees need not concern themselves with the mathematics but it can be calculated that in 68 cases out of 100 the germination percentage of any batch will be within one standard deviation, or 0.29%, of the mean of the sample, that is 98.5%.

The Manager should probably be willing to spend a further \$100 to test a total of twenty samples and gain greater confidence in the results.

- 9) If time allows, distribute copies of Exercise 2 or display a summary of it on the chalkboard/OHP. Allow trainees up to 30 minutes to attempt to solve this. Ask one trainee who has been successful to present the sequence of reasoning and calculations to the remainder. Ensure that he or she does not omit any stage because of prior familiarity with the technique:

- Mean of sample of 30 = 13.57 moisture.
- Sum of squares of deviation from the mean = 45.5.
- Sum of squares divided by number of sacks in sample = 1.52.
- Square root of 1.52, that is standard deviation = 1.237.

The Manager can be confident that 687 of sacks will be within one standard deviation of the mean.

That is 14.767 to 12.3% moisture content.

On the other hand 327 of sacks will lie outside this limit.

The Manager can be confident that 957 of sacks will lie within two standard deviations of the mean.

That is 15.997 to 11.077 moisture content.

57 of sacks, or one out of twenty, will lie outside these limits. It may therefore be no more than good luck that no bags have thus far exceeded 167 moisture, or it may be that the National Milling Corporation has not found any that do. The sample size of 30 is barely sufficient and should be increased rather than reduced. The suggested sample size of ten would be far too low.

In order to show that a sample of ten would be even less advisable than a sample of 30, a random sample of ten can be drawn from the sample of 30.

- Mean of sample = 147 moisture content.
- Sum of squares of deviation from this mean = 12.

- Sum of squares of the deviations divided by the number of sacks in the sample = 1.2.
- Square root of 1.2, that is the standard deviation = 1.09%.

The Manager can be confident that nineteen out of twenty sacks will be within two standard deviations of the mean.

That is 16.18% to 11.82% moisture content.

Some of these would already exceed the 16% limit, and around half the remaining 5% could be expected to do the same. A sample of this size is clearly insufficient.

The Manager should therefore refuse to reduce the sample of sacks checked to ten. He should test samples of 40, 50 and more in order to identify those exceeding moisture content of 16% which are probably being passed at the moment because the sample size is too small.

- 10) Trainees may be fascinated, or discouraged, by the mathematics involved in these exercises. Stress the following points:
- It is even more important to select samples properly than to have the right size of sample. Any properly selected sample of around 30 or more will give a reasonable indication of the results for the total population from which they have been selected.
 - Corruption, inefficiency and carelessness are more common causes of the acceptance of sub-standard crops than incorrect sample sizes.
 - The selection of the right sample, and effective testing procedures, do not in themselves improve the standard of crops. They merely provide more accurate information on which crop improvement programmes can be based.
 - The techniques introduced in this session only provide certain probabilities of the occurrence of items within and outside a certain range. 95% or even 99.99% probability of something happening is not the same as a statement that it will happen.

- 11) Ask trainees to suggest ways in which their own sampling procedures might be improved. Ensure that they appreciate the practical application of what they have learnt.

Possible improvements might include:

- Revise the method of sample selection in order to ensure that it includes the same proportion of items of potentially different types as does the total crop from which the sample is being taken.
- Examine the record of crop rejection and compare the cost of such rejections with the cost and potential improved accuracy of taking larger samples.
- If no mistakes are ever made and the quality control appears perfect, it may be too good. Examine the possibility of reducing the sample size in order to save time and money even at the risk of making occasional mistakes.

The Maize Farmers' Society - Part 1

The Manager of the Maize Farmers' Co-operative Society was very proud that his Society had been selected by the Ministry of Agriculture as a supplier of seed maize. Most seed maize was produced on Government farms, and only a few private farmers or co-operatives were selected to handle the supply.

Members had produced 1,000 batches of seed quality maize and the price paid for this was well above that paid for maize for consumption. The right quality had to be maintained and in order to ensure that societies selected as seed producers did not relax their efforts, a \$1,000 fine was levied on any society if one or more batches of its seed failed to come up to the 987 germination standard demanded by Government.

The Manager had instituted special Government approved testing procedures to make sure that his Society avoided such a fine. He had taken 100 seeds from each of ten separate batches and sent them to the Agricultural Research Station for accelerated germination testing. Any batch which did not come up to the 987 standard would be downgraded and sold for consumption. The test cost \$10 per batch, but the Manager was sure that \$100 was a cheap price to pay for the reassurance he gained when he looked at the results:

Batch 1	=	98.27 germination.	Batch 6	=	98.97 germination.
Batch 2	=	98.57 germination.	Batch 7	=	997 germination.
Batch 3	=	98.77 germination.	Batch 8	=	98.27 germination.
Batch 4	=	98.47 germination.	Batch 9	=	98.37 germination.
Batch 5	=	98.17 germination.	Batch 10	=	98.57 germination.

When he saw that none of these fell below the 987 level, he confidently authorised the Warehouse Manager to sell all the seed maize as seed. None need be downgraded.

Assignment :

- 1) Was the Manager right to assume that the untested batches would all reach 987 germination or more?
- 2) If not, what should he have done?

The Maize Farmers' Society - Part II

The majority of the maize grown by the members of the Maize Farmers' Co-operative Society was sold to the National Milling Corporation. The Corporation was particularly concerned to avoid excessive moisture content and they demanded that deliveries should not exceed 167 moisture. If they did the whole delivery would be rejected and subsequent deliveries would also be treated with suspicion.

The Manager of the Society was pleased that none of his consignments had ever been rejected. Members were well aware of the importance of drying their maize properly, and the Manager insisted that grain from a sample of 30 different bags should always be checked in the moisturometer. A typical series of readings for such a sample was as follows:

15%	14%	15%
14%	12%	15%
13%	11%	14%
15%	15%	11%
15%	14%	12%
14%	13%	13%
12%	13%	14%
15%	12%	15%
14%	14%	14%
13%	13%	12%

This checking took a long time, however. The Committee was anxious to save labour costs and to minimise delays at the Reception Centre, and they suggested that it would surely be enough to take a sample from ten bags. The Manager was not happy about this, but he did not know how to decide whether or not to follow this suggestion, or how to answer them if he decided to continue taking a sample of 30.

Assignment: Advise the Manager on what he ought to do.

topic

14

grading

SESSION 14

GRADING

Objective : To enable trainees to explain the necessity for crop grading and to select appropriate methods for grading their members' produce.

Time : Two and a half to three hours.

Material :

- Philippine Rice Standard Sheet.
- Copy of locally applicable crop quality standards.
- Any locally familiar grading or quality measurement device such as a moisture content tester or a spectrometer.
- Role Play Briefs "At the Crop Reception Centre."

Session Guide :

- 1) Ask trainees to suggest specific reasons why it is necessary to grade members' produce, apart from rejecting obviously unsalable crops.
 - The customers to whom the Society will sell the crops pay different prices for different grades, so the Society must do the same.

Ask trainees to explain the reasons for the different prices, and to give examples of each type:

- Certain variations in crop quality affect the amount of the final product that can be extracted or made from the crop.
(e.g. Pyrethrum content in pyrethrum flowers, sucrose content in sugar cane, butterfat content in milk.)
- Certain variations in crop quality affect the final use of the crop, and thus the price that can be obtained from the final customer.
(e.g. Rice or maize with higher than a certain content of insect infestation has to be used as animal food, fish below a certain size have to be used for fishmeal.)

- Certain variations in product quality affect its storage life and thus the way in which it can be used.
(e.g. The softness of fruit or the freshness of fish.)
- Certain variations in product quality demand more expensive subsequent processing operations and the price paid must therefore allow for the higher cost to be incurred by the customers.
(e.g. Higher moisture content in grain means that the grain must be dried before being put into storage.)
- Certain variations in product quality affect the visual appearance of the crop which in turn affects the price people are willing to pay, regardless of whether or not the content is actually any different.
(e.g. The colour of citrus fruit or apples, discoloured rice grains.)
- Certain variations in product quality make the crop unpalatable or actually dangerous to consume. This must be detected in order to ensure that it is remedied or, if this is not possible, that the crop is rejected or downgraded for a safer application. This obviously affects the value to the customer and thus the price to be paid to the producer.
(e.g. Traces of insecticide, rat dung or insect carcasses in grain, musty smells in rice.)

2) Ask trainees why it is necessary to grade produce at the earliest possible stage in the production process. Why is it not sufficient to exclude obviously sub-standard crops and to price all the remainder at an average level? More detailed grading could then wait until the stage in the process where segregation was necessary.

- It is uneconomical to pack, handle and transport crops to the point of use or further processing, and only then to find that they cannot be used or processed as planned.
- Different grades may require different forms of packing or transport or handling. If they are not distinguished from one another this cannot be done.
- The farmer, the primary society or other trading intermediary may need to use the crop as security for a loan. If the value of the crop differs significantly according to its grade, the use of an

average price may deprive a borrower of the full value of his collateral and lead banks to lend money to others on security which does not in fact cover the value of the loan.

- The main although not the only determinant of crop quality is the farmer and he should be motivated by different price levels to take all the steps he economically can to produce high quality crops.
- Any individual or organisation attempting to sell anything to a particular customer should try to satisfy that customer's needs in every way he can. Ungraded produce is less attractive to a customer, even at a lower price, than produce whose quality is clearly and objectively stated.

3) It should be clear that if grading standards are to serve the purposes which have been identified, they must be published and objectively determined:

- The nature and value of specific consignments can be described by simple reference to a number, phrase or letter, the details being understood by both buyer and seller.
- In the event of a dispute, the buyer can carry out his own tests, according to the same procedure followed by the seller.

4) Ask trainees how they can minimise disagreements with farmers or final customers over grading, and ensure that if disputes do occur they can be objectively settled without recourse to expensive legal measures:

- Samples taken for grading can be halved. One half can be tested and the other half placed in a container with a seal which prevents its being tampered with. This container can be kept by the member. In the case of dispute, he can have this sample tested by an objective third party in order to confirm or contradict the original grading.
- The above method may be unsuitable for less sophisticated farmers who have no access to objective third party testing facilities. They should be clearly shown why and how grading is carried out, and the crop reception system should be designed to allow farmers to observe every detail of the procedure and to acknowledge in writing, or at least verbally, that they are satisfied with the results.

- Monopoly buying rights should be avoided. Members should have the right to sell their crop to any buyer, and the existence of this right should encourage fair grading by the Society and the acceptance of its results by members.

s) Ask trainees individually to write down as many crop features as they can by which crops might be graded, and to write down at least one reason why this feature should be measured. They should not at this stage consider how that variable might be measured. Allow up to twenty minutes for this. When trainees have completed their lists, ask them one at a time to mention one variable. Write this on the chalkboard/OHP and continue until all items have been listed. The final list should include at least the following:

- Moisture Content: Storage life, and customers' need to know how much water they are buying.
- Nutrient Content: The effective yield of the final product or its value to the consumer.
- Broken Grain Percentage: This affects appearance and subsequent processing.
- Smell: Affects customer attraction and palatability.
- Visual Appearance: Affects customer attraction.
- Dirt Content: Customer needs to know how much of the actual product he is buying, affects customer attraction and processing.
- insect Infestation: Affects hygiene, nutrient content and customer attraction.
- Colour: Affects customer attraction and indicates nutrient content.
- Hardness: Affects subsequent processing, customer attraction and storage life.
- Presence of Different Varieties: Affects customer attraction, subsequent processing and nutrient content.

6) Ask trainees to suggest how these factors can be measured. Trainees may not be familiar with all the methods listed below and some may be

irrelevant to the crops with which they are concerned. Ensure that all factors and testing methods relate to the crops with which they are working and that trainees understand at least the basis of the ways in which each method operates.

Moisture	- Heating a sample and measuring the weight loss.	A B C D E F
	- Measuring the electrical resistance or capacitance of a sample.	A B C D E F
Nutrient Content	- Spectrographic analysis which electronically analyses the spectrum of light reflected by a sample and determines the presence and proportion of elements associated with nutrients (e.g. nitrogen indicates protein)	A B C D E F
	- Boiling, distillation or other removal of certain constituents, followed by chemical tests for presence or absence of certain elements.	A B C D E F
	- Taste.	A B C D E F
Broken Grain Proportion	- Manual counting of the broken and whole grains in a sample.	A B C D E F
	- Weighing the proportion of a grain sample that falls through a sieve of a known size.	A B C D E F
	- Visual estimation.	A B C D E F
Smell	- Personal testing.	A B C D E F
	- Electronic analysis of constituents in the vapour given off by a sample.	A B C D E F
Visual Appearance	- Visual observation.	A B C D E F
Dirt Content	- Visual observation.	A B C D E F
	- Sieving and weighing as for broken grains.	A B C D E F
	- Manual separation and weighing.	A B C D E F
	- Separation by winnowing and weighing.	A B C D E F
	- Separation by flotation or other means and weighing.	A B C D E F
Insect Infestation	- Visual observation.	A B C D E F
	- Sieving, winnowing or other separation and weighing or counting.	A B C D E F

Insect Infestation (continued)	- Analysis of chemical constituents of a sample to determine the proportion of animal matter.	A B C D E I
Colour	- Visual observation.	A B C D E F
	- Chromatograph, which automatically compares the amount of red or green, orange or green, or yellow or green on a given surface.	A B C D E F
Hardness	- Personal testing between the fingers.	A B C D E F
	- Measurement of the size of a hole produced by a controlled impact.	A B C D E F
	- Hardness testing which exerts a given pressure and measures the deformation of the sample.	A B C D E F
Percentage of Different Varieties	- Visual estimate.	A B C D E F
	- Manual counting.	A B C D E F

7) Ask trainees to suggest the ideal specification of any testing method for use at co-operative crop reception centres. Elicit the following specifications, or such of them as apply to trainees' operating circumstances:

- A Any equipment required should be easily portable and robust.
- B It should be able to be carried out in simple conditions, possibly out of doors, without electricity or clean water supply.
- C Any equipment or supplies required should be cheap and easily obtainable.
- D It should be able to be carried out by co-operative staff with a minimum of special training.
- E It should take very little time to carry out.
- F The results should be objective and not depend on personal opinion.

8) Ask trainees to suggest how well each of the testing methods identified in "6" above fit each of the ideal specifications A, B, C, D, E and F.

Write their conclusions on the chalkboard/OHP against each of the testing methods previously identified. The letters shown against the testing methods in "6" above illustrate how this might be done. If the letter corresponding to an ideal specification is written against the testing method, this method qualifies, but if it is written and crossed out the method fails to qualify by that standard.

- 9) Lack of objectivity is the major disadvantage of methods which are cheap, quick, unskilled and portable. Ask trainees how personal estimation of such factors as colour, visual appearance or the proportion of impurities can be made more objective and less subject to individual opinion:
- Colour charts can be obtained for reference and should be available at every grading station and shown and explained to members.
 - Colour photographs of carefully chosen reference samples can be packed in transparent bags and used for comparison. These should again be readily available and explained to members. If they are not available from a central bureau of crop standards or co-operative union (which they should be) they can be prepared by the society and agreed with customers before being sealed and used in the grading of members' crops.
- 10) Distribute copies of a national crop quality standard schedule or if necessary the Philippine Rice Standard Schedule which is provided with the session should be used. Allow trainees up to twenty minutes to go through the schedule individually and to determine the most suitable method of testing for each of the factors which are included, given the conditions in which farmers' crops are graded in their societies.

Ask individual trainees to suggest how each factor can be measured. Their conclusions will vary according to the schedule which is used. The following points should be stressed in relation to the Philippine example:

- The moisture test is the only one which requires any sophisticated equipment.
- Simple sieving or winnowing devices to separate particles of different sizes or weight are important for several tests and can easily be constructed with local materials.

- An accurate figure for the percentage of other varieties, unthrashed grains, foreign matter, damaged or yellow grains can only be obtained by manual separation and weighing, since the objectionable items are not necessarily different in size, weight or density from the good quality rice. Visual estimates can however be made, by the use of reference samples, and can be reasonable accurate.
- The group, the milling standard, and the percentage of chalky or yellow grain can only be measured by visual observation, which can be checked by reference to agreed photographs or samples. The staff responsible for these inspections must be particularly well trained, honest and objective.

11) Trainees may have some difficulty in understanding the reasons for and the technology of various testing methods. Stress that this understanding is only the first stage. They must in turn be able to explain each test to their members, whose income and whole livelihood may be affected by grading decisions.

If time allows, and a suitable piece of equipment is available, ask trainees whether they are familiar with whatever piece of equipment it has been possible to obtain. It is possible to conduct this role play exercise without any actual equipment, if necessary. In that case, it may be appropriate to use a smell or visual appearance test and the Role Play Briefs should be changed accordingly.

Select two trainees who are likely to be the least familiar with whatever equipment or test is being used for the exercise and give them copies of the Member's Role Play Brief. Ask them to leave the room without further conversation.

Briefly demonstrate the testing method to the remainder of the group, and give the two Inspector's Role Play Briefs to trainees who are obviously familiar with and can operate the equipment. Neither of the "Inspectors" should discuss the content of their brief to one another, or to the "Members". Both should leave the room for a few minutes.

Inform the remaining trainees that they are about to observe two different approaches to crop inspection. They should watch closely and notice how the "Inspector" performs his task and how the "Member" reacts in each case.

- 12) Ask the first "Inspector" and one of the two "Members" to play their roles. When they have finished, they should remain in the room and be followed by the second "Inspector" and "Member".

Allow the same time for each role play. The actual time permitted should be whatever time is necessary for completing the test, plus a maximum of five minutes for any explanation. The time should be calculated in advance and the "Inspectors" should be informed how long they have to complete their inspection.

When both pairs have completed their role plays, ask the "Members" to comment on their perception of the inspection procedure:

- Did they feel they were being cheated?
- Did they trust the Inspector, the test or the Society?
- Would they be likely to be discouraged or encouraged by this experience if they were thinking of selling their crop elsewhere, or withdrawing from the Society altogether?

Ask Inspectors I and II to describe their roles as given to them in the briefs and as they played them.

Ensure that all trainees appreciate the need for:

- Initial questions to ascertain what the member does and does not know about the test.
- Clear explanation, frequently interspersed with check questions to be sure that the member understands.
- Avoidance of technical terms, but due regard for the member's natural intelligence and his need and right to understand an operation whose results have an important bearing on his livelihood.

Write their conclusions on the chalkboard/OHP against each of the testing methods previously identified. The letters shown against the testing methods in "6" above illustrate how this might be done. If the letter corresponding to an ideal specification is written against the testing method, this method qualifies, but if it is written and crossed out the method fails to qualify by that standard.

- 9) Lack of objectivity is the major disadvantage of methods which are cheap, quick, unskilled and portable. Ask trainees how personal estimation of such factors as colour, visual appearance or the proportion of impurities can be made more objective and less subject to individual opinion:
- Colour charts can be obtained for reference and should be available at every grading station and shown and explained to members.
 - Colour photographs of carefully chosen reference samples can be packed in transparent bags and used for comparison. These should again be readily available and explained to members. If they are not available from a central bureau of crop standards or co-operative union (which they should be) they can be prepared by the society and agreed with customers before being sealed and used in the grading of members' crops.
- 10) Distribute copies of a national crop quality standard schedule or if necessary the Philippine Rice Standard Schedule which is provided with the session should be used. Allow trainees up to twenty minutes to go through the schedule individually and to determine the most suitable method of testing for each of the factors which are included, given the conditions in which farmers' crops are graded in their societies.

Ask individual trainees to suggest how each factor can be measured. Their conclusions will vary according to the schedule which is used. The following points should be stressed in relation to the Philippine example:

- The moisture test is the only one which requires any sophisticated equipment.
- Simple sieving or winnowing devices to separate particles of different sizes or weight are important for several tests and can easily be constructed with local materials.

- An accurate figure for the percentage of other varieties, unthrashed grains, foreign matter, damaged or yellow grains can only be obtained by manual separation and weighing, since the objectionable items are not necessarily different in size, weight or density from the good quality rice. Visual estimates can however be made, by the use of reference samples, and can be reasonable accurate.
- The group, the milling standard, and the percentage of chalky or yellow grain can only be measured by visual observation, which can be checked by reference to agreed photographs or samples. The staff responsible for these inspections must be particularly well trained, honest and objective.

11) Trainees may have some difficulty in understanding the reasons for and the technology of various testing methods. Stress that this understanding is only the first stage. They must in turn be able to explain each test to their members, whose income and whole livelihood may be affected by grading decisions.

If time allows, and a suitable piece of equipment is available, ask trainees whether they are familiar with whatever piece of equipment it has been possible to obtain. It is possible to conduct this role play exercise without any actual equipment, if necessary. In that case, it may be appropriate to use a smell or visual appearance test and the Role Play Briefs should be changed accordingly.

Select two trainees who are likely to be the least familiar with whatever equipment or test is being used for the exercise and give them copies of the Member's Role Play Brief. Ask them to leave the room without further conversation.

Briefly demonstrate the testing method to the remainder of the group, and give the two Inspector's Role Play Briefs to trainees who are obviously familiar with and can operate the equipment. Neither of the "Inspectors" should discuss the content of their brief to one another, or to the "Members". Both should leave the room for a few minutes.

Philippine Standard for Rice

A: General Requirements

- Moisture content under 14%.
- No unpleasent smell.
- No live insects.
- Rice to be packed in multiples

B: Types

- I Long grain (over 5.9 millimeters long)
- II Medium grain (5.0 to 5.9 millimeters long)
- III Short grain (under 5.0 millimeters of 5 kilograms long.)

C: Groups

- "Fancy" - Flinty, uniform, glossy, translucent, creamy white.
- "Special" - Uniform white, creamy/white, or light grey.
- "Ordinary" - White to dull white or light grey.
- "Inferior" - Coloured pericarps, discoloured grain.

D: Milling Standard

- 1st Class Polished, smooth, no lining, bran under 0.57.
- 2nd Class Two to three streaks, spots, some bran sticking to grain.
- 3rd Class (Brown) Husk only removed, second coat still there, brown, rough.

E: Packing

- Rice must be packed in new or used bags but with no patches.
- Rice should be in 50 kilogram bags or if smaller in multiples of 5 kilograms.

F: Marking

- All packages must be marked with province, year of production, type, group, variety, class, grade.
- The address of the miller.
- The weight and the date of milling.

G Grade

Factor	1	2	3	4	5	Sub-Standard
Unbroken	90%	80%	70%	60%	50%	Anything below Grade 5
Threequarter Kernels	5%	5%	5%	5%	5%	Anything below Grade 5
Chalky Kernels	Trace	5%	15%	25%	30%	Anything below Grade 5
Damaged/ Yellow Kernels	0.25%	0.5%	0.75%	1%	3%	Anything below Grade 5
Half Kernels or less	None	None	0.5%	1.5%	3%	Anything below Grade 5
Other Varieties	2%	4%	5%	7%	15%	Anything below Grade 5
Moisture Content	14%	14%	14%	14%	14%	15%
Foreign Matter	None	0.5%	0.75%	1%	2%	over 2%
Unmilled	None	1 per 500 grains	2 per 500 grains	2 per 500 grains	4 per 500 grains	over 4 per 500 grains

At the Crop Reception CentreRole play brief: The Member

You are an illiterate and unsophisticated member of a co-operative society, but you are naturally an intelligent and shrewd individual. You have only recently joined the Society and you have brought your crop to the Society's Crop Reception Centre for the first time. You see some tests being carried out with complicated looking pieces of machinery which you have never seen before. You are aware that the Society grades its members' crops, but you have no idea how this is to be done. You have had little contact with technical matters, and are rather untrusting of things that you do not understand.

You do know that you can refuse to accept the results of any test, although this is not likely to be popular with the Society's staff or with the other members who are standing in a long line behind you awaiting their turn. The Inspector has just taken a sample from your crop since it is now your turn for the test.

At the Crop Reception Centre
Role play brief: The Inspector (I)

You are an Inspector at the Crop Reception Centre of an Agricultural Co-operative Society. You are tired after a long day of grading members' crops, and you are in particular irritated by the ignorance and stupidity displayed by so many of the farmers. You are very familiar with the instrument you are using, and you are totally confident that it is a fair and objective way of grading the crop. There is still a large number of members waiting to deliver their crops, and you, and you suspect they, are tired of wasting time. You are determined to test members' crops as fast as possible from now on, and to resist any attempts by them to discuss or argue with the conclusions.

You know that members can refuse to accept the results of any test, but you have succeeded so far in persuading them to agree by pointing out how angry any further delay will make the other members who are still waiting. You have also implied that if they do object this may lead you to give their crop a lower grade than you would otherwise have done. You are confident that the instrument can only make a mistake if it is misused, and you know that your fine technical training will ensure that you do not do this; why should members worry?

At the Crop Reception Centre
Role play brief: The Inspector (II)

You are an Inspector at the Crop Reception Centre of a co-operative society. You are responsible for undertaking a particular test with an instrument which is unfamiliar to many of the members. It is getting late, and large numbers of members are still waiting to deliver their crops, but you have been trying, generally successfully, to ensure that every member understands and accepts what you are doing and the results of the test you are conducting.

You attempt to find out whether or not each member is familiar with the nature of the test; if he is not, you explain every stage of the operation to them, slowing down marginally if this is necessary in order to make sure it is understood. You realise that this may make it longer to test each member's crop, but you are sure that it saves time in the end if members do not delay operations by arguing with you. Members have the right to refuse to accept the results of any test, but none have exercised this right so far.

topic

15

deception and prevention

SESSION 15

DECEPTION AND PREVENTION

Objective : To enable trainees to anticipate attempts to defraud members or the Society, and to close the loopholes that make such attempts possible.

Time : One and a half to two hours.

Session Guide :

- 1) Divide trainees into two groups. One group is to represent dishonest members. They are to list as many ways as they can in which they might individually defraud their co-operative society in the collecting and receiving process.

The other group should represent society staff. They should attempt to foresee as many as possible of the members' techniques and to think of ways in which they might be prevented.

Nominate a "Chairman" for each group. His or her job should be to preside over the group's meeting. He or she may also care to appoint a "Secretary" to write down the various forms of dishonesty, or protection, which are put forward.

The details of the crop and procedures should depend on local conditions. In order to ensure reasonable consistency between the groups, it may be appropriate to impose basic factors such as the following:

- The crop is brought by members to the collecting centre.
- The crop undergoes two simple quality checks. One or more samples are taken from each member's crop according to the volume he has delivered.
- The crop is weighed.

- The packing is issued by the Society before harvest and recovered at the Collection Centre. Shortfalls (or surplus) are debited (or credited) to members' accounts.
- The crop is valued according to its grade and weight.
- Members are paid cash at the Reception Centre.

Items of fraud and protection should be listed in the sequence of these operations. A deception to be attempted at the weighing stage, for instance, should be listed after any attempt to obtain higher than the right grade and before attempts to cheat the Society at the payment stage.

If appropriate, nominate a particular crop and set of tests which are familiar to trainees as a basis for the exercise. Otherwise, trainees may suggest deceptions and protection methods which might apply to any crop given the basic conditions outlined above. Their lists may include items which have been suggested by earlier sessions in this course.

Warn the Chairmen that their groups' suggestions must be clearly and legibly listed, and they should avoid any duplications whereby a particular item is listed twice using different words.

Allow the groups up to 30 minutes to complete their lists. They should of course do this in separate rooms out of earshot of one another.

- 2) At the end of the 30 minute period collect both groups' completed lists. The group representing the Society's staff should now be asked to make a similar list. This time however, they should list as many ways in which they as the Society's staff can individually defraud the members and make money for themselves personally, rather than for the Co-operative Society. The group representing the members should at the same time make a list of all the ways in which they might protect their interests as members against dishonest staff. They can list things which they themselves would do on their own, and also which they would insist that their Society should do for them.

Allow twenty minutes for the preparation of these second lists. Ensure that both lists are clearly and legibly written and that the first two lists are taken from the groups before they prepare the second two.

- 3) Reassemble trainees and ask the Chairman of the Members' Group to read out their first attempt at fraud. The Chairman of the Staff Group should then read out what he or she believes to be the item on their list of security techniques which is most likely to prevent that particular fraud.

The Instructor should then rule as to whether or not that security measure does indeed prevent that fraud. If it does, the Society's Staff Group get one point, and if the Staff Group has not anticipated or prevented the member's fraud, the Members' Group are awarded one point. Continue the process until the members have read out all their frauds. Keep a running total of the score as the game proceeds.

Then ask the Staff Group Chairman to read out their first technique for defrauding members. The Members' Group Chairman should similarly search their list to see if they have anticipated the staff's idea. Once again the Instructor should rule as to whether or not the fraud has been foreseen and prevented, and should award points on the same principle as above.

- 4) The group with the highest number of points wins the "game". In the event of a tie, the group with the largest number of "unused" security measures can be considered as the winner. These extra security measures should in any case be read out in order to reveal any forms of fraud which have not been listed by either side.
- 5) Members' lists of frauds and security measures will depend on the crops and reception facilities with which they are familiar. The following are typical suggestions for fraud together with security measures which might be judged to prevent them.

Member's Frauds

- Specially prepare a small quantity of their crop for sampling.
- Bribe inspectors to produce falsely favourable results.

Society's Staff Security Measures

- Take samples at random from different parts of the member's crop.
- Double check a sample of inspection tests.
- Rotate staff among the inspection tasks.

Member's Frauds

- Avoid one particular test which the crop is known to be going to fail.
- Bring in additional produce to add to what has already been tested.
- Add water to increase crop weight.
- Add sand to grain, water to milk or other easily concealed forms of adulteration to increase weight.
- Use wet sacks to increase the weight.
- Place foot or other object on the scales to increase weight.
- Distract weighing clerk's attention and have some bags weighed twice.
- Falsify records of test results before payment is calculated.
- Stack bags so that weighted, dampened or other "loaded" ones are concealed by good bags.

Society's Staff Frauds

- Falsify results of test because members are ignorant of what is involved.
- Substitute lower standard crops for members' samples.
- Take false readings, relying on members' illiteracy.

Society's Staff Security Measures

- Organise a reception system so that at the final calculation cannot be completed unless all the test results have been entered.
- Segregate batches clearly from one another.
- Include careful visual inspection and moisture tests for all absorbent products.
- Include very rigorous visual inspection and test for basic nutrient content of milk.
- Tare weigh all containers of any kind, immediately after weighing and emptying full containers.
- Ensure that the area around the scale is clear and free from stacks of goods or anything else.
- Mark weighed bags with Society's seal.
- Ensure that duplicate tests results are cross checked with members' copies.
- Ensure that sampling is genuinely random.

Members' Security Measures

- Train members in the nature and purpose of the tests.
- Carry out testing in full view of members, with no rubbish to block view of tests.
- Educate members, provide simple posters illustrating the dials and their related grades.

Society's Staff Frauds

- Enter false scale readings.
- Enter false figures in members' accounts.
- Reduce the scale reading with the foot or other device.
- Make "mistakes" in calculations.
- Give less money than is stated on the documents.

Members' Security Measures

- Have scale dial in full view, clean and visible, and separate the weighing and recording tasks.
- Give members a copy of all entries and explain them.
- Scale to be fully visible from all sides.
- Train members, provide copies of manual or machine calculations and explain them.
- Ensure that members see, understand and sign completed calculation entries.

6) Trainees will undoubtedly think of many other forms of fraud. Stress the following general points at the conclusion of the session:

- Fraud thrives on ignorance. Member and staff training are the best long term protection.
- Fraud thrives on dirt and disorganisation. Reception centres and the testing and other equipment must be clean and the flow of produce must be smooth and co-ordinated.
- Dishonest members and staff cannot be taught to be honest. Management must minimise opportunities which tempt the potentially dishonest, and ensure that the Society is run in such a way that both staff and members feel that they are earning a fair reward for a common endeavour.

topic
16

calculations and payment

SESSION 16CALCULATIONS AND PAYMENT

Objective : To enable trainees to design and operate simple, rapid and secure systems for calculating amounts due and making appropriate entries or payment for members' credit.

Time : Two to three hours.

Material : Exercises "Calculation test " (all trainees should have calculators if they are generally available to them at work).

Session Guide :

- 1) Distribute a copy of Exercise 1 to all trainees. These should be laid face down on the table. Explain that they are to have 40 minutes in which to complete a simple exercise in rapid, accurate and organised calculation. They must not use calculators. Ask trainees then to turn their exercise sheets over and to start work. Time the period exactly and when it is over ensure that they all stop writing.
- 2) Ask one trainee who might be expected to have worked too fast and thus to have made many simple mathematical errors to give his answer to Question 1. Check all trainees' answers before stating which is correct. It is important throughout this session that trainees should recognise and acknowledge any weaknesses they may have in simple three function arithmetic. Record how many questions each trainee has answered correctly. Stress that simple small errors are as important as large ones.
- 3) Go through the calculations in some detail. Stress that neat layout and careful calculations are as important as an understanding of what needs to be done. Senior management cannot act as if they were too well qualified and experienced to be expected to work out simple calculations and nobody

can use a calculator effectively unless he or she understands how to do the calculations without one.

Trainees may have "ready-reckoner" books which show how much must be added to or taken away from various sums at various rates of discount or bonus. These should be used if they are generally available. if not, introduce trainees to the following method of calculating bonuses or discounts:

$$2 \frac{1}{2}\% \text{ Bonus} = 102.5\% = \times 1.025$$

$$1 \frac{1}{44}\% \text{ Discount} = 98.75\% = \times .9875$$

Ask trainees to work out similar examples to ensure that they are familiar with the method.

The calculations should be laid out as follows. The figures may be prepared in advance on an OHP transparency or flipchart, and displayed at this stage.

i)	352 kilograms	
	215 kilograms	
	159 kilograms	
	101 kilograms	1,497 kilograms
	92 kilograms	<u>x 27</u> cents
	300 kilograms	299.40
	<u>278</u> kilograms	+ <u>104.79</u>
	Total 1,497 kilograms	= \$ <u>404.19</u>

ii)	0.739 tons	
	x <u>\$ 243</u>	
	147.800	
	+ 29.560	
	<u>± 2.217</u>	
	= \$ 179.58 (rounded to the nearest cent)	.

$$\begin{array}{r}
 \text{iii)} \quad \quad \quad \$ 27.5 \\
 \quad \quad \quad \times \quad \underline{19} \\
 \quad \quad \quad 275.0 \\
 \quad \quad \quad \pm \quad \underline{247.5} \\
 \text{Discount} = \$ 522.5 \\
 \quad \quad \quad \times \quad \underline{.965} \\
 \quad \quad \quad 470.2500 \\
 \quad \quad \quad + \quad 31.350 \\
 \quad \quad \quad \pm \quad \underline{2.6125} \\
 \quad \quad \quad = \quad 504.2125 \quad = \quad \$ 504.21 \text{ (rounded to nearest cent)}
 \end{array}$$

$$\begin{array}{r}
 \text{iv)} \quad \underline{\text{Extra Grade}} \quad 183 \text{ kilograms} \\
 \quad \quad \quad \pm \quad \underline{201} \text{ kilograms} \\
 \quad \quad \quad = \quad 384 \text{ kilograms} \\
 \quad \quad \quad \times \quad \underline{1.76} \\
 \quad \quad \quad 384.00 \\
 \quad \quad \quad + \quad 268.80 \\
 \quad \quad \quad \pm \quad \underline{23.04} \\
 \quad \quad \quad = \quad \$ 675.84 \\
 \quad \quad \quad \times \quad \underline{1.025} \quad (\text{Quality Premium}) \\
 \quad \quad \quad 675.84000 \\
 \quad \quad \quad + \quad 13.51680 \\
 \quad \quad \quad \pm \quad \underline{3.37920} \\
 \quad \quad \quad = \quad \underline{\underline{\$ 692.73600}}
 \end{array}$$

Price = \$ 692.74 (rounded to the nearest cent)

$$\begin{array}{r}
 \underline{\text{Normal Grade}} \quad 179 \text{ kilograms} \\
 \quad \times \$ \quad \underline{1.76} \\
 \quad \quad \quad 179.00 \\
 \quad \quad \quad + \quad 125.30 \\
 \quad \quad \quad \pm \quad \underline{10.74} \\
 \quad \quad \quad = \quad \$ \underline{315.04}
 \end{array}$$

<u>Sub-Standard Grade</u>		1.76	
	x	<u>0.875</u>	i.e. 12%% discount
		0.87500	
	+	0.61250	
	±	<u>0.05250</u>	
	= \$	1,54000	
	x	<u>197</u>	kilograms
		154.00	
	+	138.60	
	+	<u>10.78</u>	
	= \$	<u>303.38</u>	

<u>Grand Total:</u>	Extra Grade	692.74
	Normal Grade	315.04
	Sub-Standard Grade	<u>303.38</u>
		\$ 1,311.16
	x	<u>1.0125</u> Bonus
		<u>= \$ 1,327.55</u>

Stress that even if only one trainee had made only one mistake (and there are bound to be many more) this would represent a serious state of affairs. Ask trainees to diagnose their own and other mistakes. Examine trainees' calculations and elicit the following types of error among others:

- Failure to read the question properly.
- Simple errors in addition or subtraction caused by excessive hast.
- Failure to check calculations.
- Disorganised layout leading to confusion over location of decimal points or misreading.
- Inaccurate copying of the figures from the question paper.
- Errors untidily corrected and then misread which lead to further mistakes.

Stress that mistakes of this sort are far more serious than ignorance of sophisticated techniques. The purpose of this session is to alert trainees to their own and their staff's weaknesses in this area, and to suggest ways in which mistakes of this sort in their calculations of members' payments can be minimised.

- 4) Trainees who regularly use calculators may object that it is unnecessary to be able to complete lengthy simple mathematics of this sort since the calculator makes the task so much quicker and more accurate. Stress that calculations are indeed quicker with a calculator, but that unless the user is able to do the same calculations himself without the calculator, the effect of the electronic equipment will be merely to enable him to make the same mistakes only rather more quickly than before.
- 5) If calculators are, or can be available to all trainees in the field as well as in training and batteries can also be easily purchased, it may be appropriate at this stage to lend or issue calculators to those who have not already got them, and to ensure that all trainees understand how to use them.

Stress in particular:

- The use of the "c" or "ce" button to clear the most recent entry without clearing the whole calculator.
 - The use of "k" or "constant" button to retain a constant multiplier or divisor, such as when extending a number of weights at the same price.
- 6) If calculators are in general use, ask trainees to complete the exercise again, using a calculator. Allow a maximum of five minutes for this. Ensure that trainees do not have access to their earlier results and that they cannot see the worked calculations which were presented earlier.

Give the correct answers again. Some trainees will almost certainly have made further errors. Identify them and ensure that all trainees appreciate that calculators alone cannot guarantee accuracy, and often

do no more than enable people to make more, larger mistakes more quickly than before.

- 7) Ask trainees individually to look once more at Exercise 1, and to draw up designs for slips which would simplify the calculation technique and ensure that some at least of the mistakes they have been making would have been avoided. Allow up to twenty minutes for this.

Ask trainees to present their suggestions. Possible designs are given on the following pages.

Compare these designs with trainees' suggestions and any actual payment slips which are available. Stress that many mistakes can be avoided by clearly designed forms which compel the clerk to lay out the information neatly and not to omit any stages in the calculation.

- 8) Distribute Exercise 2, again face down on trainees' desks. Warn them that they are about to have a further opportunity to test their calculation skill, and also to measure the effect of the session, since the results will be directly comparable to those of the first test.

Ask trainees to turn their papers over and allow 40 minutes for completing the test. Those who have calculators may use them.

- 9) At the end of 40 minutes ensure that all trainees stop writing. Mark the test as before, and compare trainees' success with what they achieved last time. If some but not all have used calculators, compare their results with those who have not used them. It is unlikely that those with calculators will have been more successful than those without.

If the trainees' results have improved significantly, stress that this shows that they can themselves improve their staffs' ability in the same way.

If not, or if some trainees have achieved better results and others the same or worse, stress that bad habits are difficult to change. They should attempt to improve their own calculating ability by practice, and

WHEAT GROWERS' CO-OPERATIVE			
Date: _____		Membership No: _____	
Bags Delivered: _____		Name: _____	
1	kg.	Total b/f	kg.
2	kg.	11	kg.
3	kg.	12	kg.
4	kg.	13	kg.
5	kg.	14	kg.
6	kg.	15	kg.
7	kg.	16	kg.
8	kg.	17	kg.
9	kg.	18	kg.
10	kg.	19	kg.
Total c/f	kg.	20	kg.
Total Weight			
Signed: _____			
Price per kg.			
Total Due \$			

POTATO GROWERS' CO-OPERATIVE		
Date: _____		Membership No: _____
Grade: _____		Name: _____
Amount Delivered	kg.	Signed: _____
Price per kg.	\$	
Total Amount Due	\$	

CANE GROWERS' SOCIETY		
Date: _____		Membership No: _____
Cane Delivered	kg.	Name:
Price	\$	
Gross Amount Due	\$	Signed:
Allowances or Penalties	\$	
Net Amount Due	\$	

CATTLE CO-OPERATIVE			
Date: _____		Membership No: _____	Name: _____
	Quality		
	Extra	Normal	Sub-Standard
	kg.	kg.	kg.
	kg.	kg.	kg.
	kg.	kg.	kg.
Total Weight	kg.	kg.	kg.
Price per kg	\$	\$	\$
Total Amount	\$	\$	\$
Amount Due for:			Signature:
Extra Quality	\$		
Normal Quality	\$		
Sub-Standard Quality	\$		
Total Amount Due	\$		
Allowances or Penalties	\$		
Net Amount Due	\$		

should work with their staff to ensure that they do not make simple mistakes of this sort when working under pressure at harvest time.

If necessary go through the answers as before, and ensure that they are properly laid out. The answers are:

Farmer E: $\$38.50 \times 17 = \654.50×0.955 (i.e. less 4½% discount) = $\$625.05$ (rounded to the nearest cent).

Farmer F: 788 kilograms \times 15 cents = \$118.20.

Farmer G: - 215 dozen \times \$1.38 = \$296.70 \times 0.905 (i.e. less 9½% discount) = \$268.51 (rounded to the nearest cent).

- 109 dozen \times \$1.38 = \$150.42.

- 78 dozen \times \$1.38 = \$107.64 \times 107.5 (i.e. plus 7½% discount) = \$115.71 (rounded to the nearest cent).

- Total amount due = \$534.64.

Farmer H: 128 kilos \times \$0.317 = \$40.58 (rounded to the nearest cent).

- 10) Ask trainees to put themselves in the position of 4 member who has just delivered his crop to the society. He has worked hard for several months to produce it, and it is his main or even his only source of income. How will he want to be paid for it, and why?

Clearly the most immediately attractive method of payment is cash.

- Cash is immediate tangible evidence of value, and someone who has worked hard for a long period naturally feels he has a right to immediate access to the sum received for his work.
- If prices are increasing, it is more economical to buy whatever you are able to buy as quickly as possible.
- If you are not completely confident about the administration or staff honesty in your society, you want to have your money out of the society as soon as possible.

11) Ask trainees why most societies do not in fact pay their members on the spot in cash when produce is delivered:

- Large amounts of cash pose a security problem, particularly if the collection centre is a temporary one located away from the society's headquarters.
- Members' outstanding loans from the society must be set against the amounts due for crop deliveries. The necessary calculations may further delay the crop collection process.
- The society itself will not be paid for the produce until it has been resold, or perhaps sometime after that. Immediate cash payment to members may not be possible, or might require the society to borrow money at high rates of interest.

12) These reasons are from the society's management point of view. Although the society ultimately reflects members' interests, members may need more immediate arguments to persuade them that it is in their own interest to accept something other than immediate cash settlement. Ask trainees to suggest arguments which they might use with an individual member who demands cash.

- Large sums of cash may easily be stolen from members as they return from the reception point, particularly if it is well known that such sums are being paid out on that day.
- Among all the activities involved in collecting and receiving produce it is very easy to make mistakes when handing over cash. A book entry, or a cheque, avoids one further stage at which mistakes might be made. Such mistakes are likely to be in the society's rather than the member's favour because staff will be anxious to avoid shortages in their cash balance.
- Members should be able to earn interest on balances retained by the society, or at least to avoid paying interest on outstanding loans which can be settled with the receipts from crop deliveries.
- Members may recognise the danger of having a large sum of cash at their immediate disposal. They or their relatives may be tempted to spend it unwisely and then be unable to afford things they really need later.

- 13) Ask trainees to suggest other ways in which payment may be made, other than cash:
- By cheque, which can be converted into cash or placed to the credit of a member's account with the society or elsewhere.
 - By credit entry in a member's pass-book, showing the balance due to the member.
 - By a note of an entry in a loan account, followed by a cheque for the credit balance or other transaction at a later date.

If possible, a passbook is the best solution. This should cover all the financial transactions between the member and his society, and members should recognise a credit balance in the passbook as being the same as cash except that it earns interest.

Remind trainees of the calculation exercise at the beginning of the session. Stress that payment must:

- Be correctly calculated.
- Be quickly finalised.
- Be made in a form which is acceptable to the society and to its members.

- 14) Some trainees may have difficulty with the placing of decimal points, and in writing large numbers in figures or words. Errors of this sort arise from carelessness rather than ignorance. Trainees should be made aware of the need to care by a simple test.

Ask trainees to "translate" the following figures into words and vice versa. If necessary, they should be written on chalkboard/OHE:

- 436242.
- Thirteen million four hundred and two thousand nine hundred and ten.
- 316425001.
- Five billion fourteen million eight hundred and three thousand four hundred and seven.

Many trainees will have made mistakes. Remind them that care is more important than speed.

Exercise 1Calculation Test

You have 40 minutes to complete this test. Write the answers, and your workings, on another sheet of paper and start NOW.

(N.B. Answers should be rounded to the nearest cent.)

- 1) Member A has delivered seven batches of maize weighing three hundred and fifty-two kilos, two hundred and fifteen kilos, one hundred and fifty-nine kilos, one hundred and one kilos, ninety-two kilos, three hundred kilos and two hundred and seventy-eight kilos. The buying price is twenty-seven cents a kilo. How much in total should the member receive?
- 2) Member B has delivered seven hundred and thirty-nine kilos of potatoes. They were graded number two, and he was entitled to be paid at the price of two hundred and forty-three dollars a ton. How much money is due to him?
- 3) Member C delivered nineteen tons of sugar-cane; the price to be paid was twenty-seven dollars fifty cents per ton, but because the cane had been left lying in the field too long it was subject to a three and a half percent penalty. What should he be paid?
- 4) Member D delivered four head of cattle for slaughter. They killed out at the following weights; one hundred and eighty-three kilos, one hundred and ninety-seven kilos, two hundred and one kilos and one hundred and seventy nine kilos. The first and the third were graded extra quality and the second was graded sub-standard. The last one was normal. The normal price was one dollar seventy-six cents a kilo. Sub-standard carcasses were subject to a discount of twelve and a half percent from the normal price while extra quality carcasses enjoyed a premium of two and a half percent over the normal price. All meat was subject to an over-riding one and a quarter percent out-of-season slaughtering bonus. How much should the member be paid?

Exercise 2

Calculation Test

You have 40 minutes to complete this test; write your answers and your workings on another sheet of paper; start NOW.

(N.B. All answers to be rounded to the nearest cent).

- 1) Farmer E delivered seventeen tons of cassava. The price to be paid was thirty-eight dollars fifty cents per ton, and four and a half percent had to be deducted for transport costs. What should he be paid?
- 2) Farmer F delivered seven batches of coffee beans weighing one hundred and seven, one hundred and twenty-four, ninety-nine, one hundred and eighteen, one hundred and twenty-three, one hundred and nineteen and ninety-eight kilos. The buying price was fifteen cents a kilo. How much was due to him?
- 3) Farmer G delivered four batches of eggs, one of ninety-eight dozen, one of a hundred and nine dozen, one of seventy-eight dozen and one of a hundred and seventeen dozen. The first and the last were small size, the second was standard and the third were large size. The price for standard eggs was one dollar thirty-eight cents a dozen. Large size eggs enjoyed a premium of seven and a half percent while smaller eggs incurred a penalty of nine and a half percent. How much should the member be paid for his eggs?
- 4) Farmer H delivered one hundred and twenty-eight kilos of tomatoes to his society. They received top grade, and he was therefore entitled to receive the price of three hundred and seventeen dollars per ton. How much should he be paid?

topic

17

recording procedures

SESSION 17

RECORDING PROCEDURES

Objective: To enable trainees to design, install and manage effective systems for recording the results of receiving and grading operations.

Time: Two to three hours.

Material: Case study "The Ruralian Wheat Growers' Society's System."

Session Guide:

- 1) Divide trainees into groups of not more than six people each. Distribute the exercise and explain carefully to trainees what the situation of the Society is, and what they have to do, and allow groups up to 30 minutes to complete the assignment.
- 2) Reconvene the class. Ask each group in turn to make one suggestion for a problem which might arise from Student A's proposal. When all possible problems arising from this have been summarised on the chalkboard/OHP, carry out the same procedure for the proposals for Students B, C and D.

Trainees may suggest the following problems among others:

Student A

- Members may alter the entries on the cards in their own favour.
- Members may lose the cards while waiting for the next stage in the system.
- Members may exchange cards with one another in order to combine higher grades with higher quantities.
- Staff may make false entries to cheat illiterate members or to inflate the results of members who bribe them.

- Illiterate members will not be able to write their names properly on the cards.

Student B:

- Staff may enter one member's results on the card of another.
- Staff may make false entries on cards, because members do not have possession of the cards.
- Cards may be mislaid between stages in the system.
- Staff have no record of results of their stage of the inspection.
- Excessive paperwork costs money and time.
- Delays in payment may result from the large numbers of documents.

Student C:

- Staff may make false entries.
- The Payment Clerk may collect the wrong data.
- Payment will be delayed while the Clerk is collecting data.
- The member has no control or opportunity even to observe what is being decided about his crop.
- Members may miss one stage in the process and this will not be observed.
- Excessive paperwork costs money and time.

Student D:

- Members may alter the entries on their forms.
- Members may deliberately or by mistake lose the slip while waiting for the next stage.
- Staff will have no record of the total results for each stage.
- Members may miss one stage in the process and this will not be observed.

- 3) Ensure that every potential problem is discussed and explained, and that it is genuinely associated with the particular proposal to which it has been linked. Remind trainees that it is easy to criticise but harder

to do better. Divide them into the same groups and allow them up to a further 30 minutes to design a system which will solve these problems. If time allows they should produce drafts of whatever forms or books of entry they propose and they should be provided with OHP or flip-chart sheets to prepare illustrations for their presentation.

- 4) Reconvene the class. Ask each group in turn to present its proposal. Compare and discuss them. Remind trainees that details of signatures, what is or is not included in entries, responsibilities and form layout and design are important. Managers may consider that they can leave these things to clerks, but the smooth operation of many systems depends to a large extent on these details.

Groups' suggestions should be carefully examined by other trainees to see if they do or do not prevent the same or similar problems to those already listed in the first part of the session.

If there is not enough time for the second group exercise, ask trainees individually to suggest improvements to whichever system they prefer from the case study, in order to design an "ideal" system, which provides maximum information and security with minimum expenditure on forms and paperwork. Discuss their suggestions, and elicit, a final result which need not necessarily be similar to what follows; this is merely given as an example.

- a) At the first stage, the Visual Inspector completes a three-part form including:
 - member's name and membership number,
 - the results of his inspection, and
 - his own signature.
 - The member initials the result of the visual inspection.
 - The complete form is passed to the next inspection stage.
- b) The Moisture Testing Inspector fills in the moisture test result and signs it and the member initials it.
- c) The Spectrometer and Weighing Inspector do the same for their stages in the process.

d) The complete set reaches the Payment Clerk. He makes the necessary calculations, he and the member jointly sign them and the member retains the top copy as his permanent record. The Society retains the other two copies and payment is made or the necessary account changes are entered.

A possible design for the three-part form could be as follows:

Name of Society: _____		Date: _____	
Name of Member: _____		Membership Number: _____	
Item	Result	Signature	Member's Initials
Visual Inspection			
Moisture Test			
Protein Test			
Gross Weight: _____		Net Weight: _____	
Packing Weight: _____		Packing Returned: _____	
Price per kilogram: _____		Total Price	
		Credit for Packing	
		Total Sum Due	\$

5) Compare the above and/or trainees' suggestions with the original ideas put forward in the case study. Stress that while those suggestions were faulty partly because they did not have enough paperwork, many co-operative systems suffer from too much paper. Ask trainees why too much paperwork can cause as many problems as too little:

- The cost of printing is not negligible. The cost of filling in forms, counting, recording and above all filing them is very expensive.
- The actual physical handling of produce is delayed by time spent filling in forms.
- If there are too many forms, some of which are unnecessary, people do not spend enough time or care to make sure that figures which are important are correct.

- Illiterate members are confused and alienated by a mass of paperwork that seems to be designed more to occupy the staff than to protect the members.
- Important papers and information are difficult to find in a mass of unimportant material.

6) Stress that every piece of paper, and every entry on a piece of paper, must be "tested" with the following questions:

- Does anybody do anything different as a result of what is written down?
- Is the same information easily available somewhere else?
- Does the cost of writing down and filing the information exceed the cost of whatever might happen if it was not recorded?
- Would the person or people who are supposed to need the information even notice if they did not receive it? (This can be checked by continuing to prepare the document but deliberately omitting to send it to whoever is supposed to need it, for a trial period.)

Trainees may underestimate the cost of paperwork, since blank forms themselves are inexpensive. Ensure that they appreciate that paperwork is very expensive, even if no obvious savings are achieved if one document or copy of a document is dispensed with.

7) Ask selected trainees to describe the paperwork they use in their own co-operative receiving systems, and to compare this with the system described so far. If possible, circulate actual forms among trainees, and invite criticism, comment and suggestions for feasible and positive improvements.

The Ruralian Wheat Growers' Society's System

The Ruralian Wheat Growers' Co-operative Society had only recently been formed, and its members, Committee and staff were determined that it should be the most efficient and profitable co-operative in the area. They were particularly keen to ensure that their wheat should be of the highest quality, so that it could be sold for bread or biscuits rather than being downgraded for animal feed. They set up a very modern receiving station ready for the harvest; as each member brought his harvest, it would pass through the following stages:

- 1) A brief visual inspection to check for obvious foreign matter, withered old grains or excess chaff.
- 2) A moisture test to measure the percentage of moisture in the grain.
- 3) A spectrometer test to measure the proportion of nitrogen in the grain, which in turn indicated the protein content.
- 4) Weighing and counting of returned bags.
- 5) Grain emptied into the Society's bins.

The Committee had agreed to purchase the latest moisturometer and spectrometer, and they had a very accurate platform scale. The staff were trained to perform the tests very carefully and since the price per ton paid to the individual member varied according to the moisture and protein tests as well as the weight, they too were anxious that the grading should be done properly.

The Manager of the Society had been well trained in agriculture and fruit chemistry, and he was sure that the Society's reception facilities were second to none in the country. He realised that it would be necessary to make a record of the results of each inspection, in order to find out how much each member should be paid, and since he had little experience of administrative paperwork he asked a friend of his who lectured at the local business college whether he had any ideas.

Student B:

The first Inspector should after completing each inspection fill in a card giving the name and membership number of the owner of the wheat and the result of the test. He should then pass this card to the next Inspector, who should then complete his own card and pass on the two cards; each Inspector should similarly add one card; the completed cards should be passed to the Payment Clerk for extension and payment.

Student C:

Each Inspector should enter the name, membership number and result of his inspection for each member in a book. When the member reaches the Payment Clerk the Clerk should ask each Inspector for the results for that member, write them down, make the necessary calculations and pay accordingly.

Student D:

Each Inspector should fill in a separate slip for each member, showing the name, membership number and the result of the test. The slips should be given to the member; when he reaches the Payment Clerk he should hand all of them over to him for extension and calculation of payment.

The lecturer refused to help the Manager decide between the four systems. He was confident that all his students were well trained and would suggest reliable systems and the Society should therefore choose for itself.

Assignment: Analyse the four suggested systems; write down as many difficulties as you can that might be expected to occur as a result of the operation of each of the four systems.

topic

18

disputes and decisions

SESSION 18

DISPUTES AND DECISIONS

Objective: To enable trainees to apply what they have learned to a range of collecting and receiving problems, and to identify and forestall particular disputes or disagreements between management, the society and its members.

Time: One to one and a half hours.

Material: Tape Dialogue "The Chaotic Collection Centre".

Session Guide:

- 1) Tell trainees they are about to hear (or witness) a recording of a simulated discussion and interchange at a co-operative crop reception centre where members are delivering their maize. There will be disagreements and arguments between the Society's management, its inspectors and the members. Although the number of problems that arise in the few minutes of the dialogue may be exaggerated, they are all real problems which actually occur. The recording, or play, will be interrupted after each problem or set of problems. Trainees should briefly note down what they think should have been done to prevent this occurring. Some of the remedies will have been covered in the course, while others may be new to trainees. After the recording has been played, trainees can "test" their knowledge, and the value of the course itself, by seeing for how many of the problems they have been able to identify potential remedies.
- 2) The dialogue should be recorded on a tape recorder before the session, preferably with local names, crops, currencies and so on, and with a background of appropriate sound effects. This recording does not require any special facilities. The actors can sit around any reasonable quality portable tape recorder with a built-in microphone, or can speak into a traditional microphone in turn.

If no recorder is available, the dialogue may be enacted by selected trainees in front of the class. They should be given an opportunity to rehearse and modify the dialogue. The pauses in the taped recording, or in the action, need only be long enough to enable trainees very briefly to note down what ought to have been done.

- 3) Play through the tape again, or briefly remind trainees of the nature of each problem if it was enacted. Stop at each pause and ask trainees for their suggestions and to appropriate remedies. There are a variety of reasonable responses to each problem, but one set of possible answers is as follows:

Pause A:

- Societies should aim to foster members' loyalty by good service and not by compulsion monopoly buying rights or speeches.

Pause B:

- Calculate the time taken to process crops correctly.
- Notify members of realistic times in small groups to avoid waiting.
- Have a numbered ticket system to enable members to make good use of waiting time.

Pause C:

- Provide shelter if crops are likely to have to stand outside the Reception Centre.
- Ensure that produce which has been accepted is segregated from crops awaiting grading through effective layout, differentiated packing or bulk storage after reception.

Pause D:

- Staff should treat members with respect, as the owners of the Society whom they as staff must serve.
- Samples must be taken at random.
- Staff should explain to members what they are doing and ensure they understand.

- Train staff to work efficiently.

Pause E:

- Organise the various stages of the reception system so that each takes about the same amount of time.
- Train members as to the meaning and purpose of grading checks.
- Give a copy of the grading results to members.
- Ensure that members or staff cannot alter grading results after they have been made.

Pause F:

- Inform all members of the time of collection.
- Ensure that the exact place of collection is agreed if there is any possibility of confusion.

Pause G:

- Collection to be carried out according to a definite schedule.
- Ensure that responsibility for loading and unloading is clearly laid down.

Pause H:

- Ensure that scale readings are clearly visible to members and understood by them.
- Ensure that conversion tables are displayed and explained showing the relationship of measures used to any traditional measures if scales are not available in these traditional measures.

Pause I:

- If standard bags are required, they must be easily available, or supplied by the Society if necessary.
- All packages must be weighed empty to calculate the correct deduction from gross to net weight.
- Calculations must be written down, explained and agreed by members.

- If calculators are used, they should if possible be the type that prints out the result.

Pause J:

- Members must be trained to understand the principle of sampling.
- Any test which may lead to rejection must be carried out on members' arrival at the entrance, or preferably on the farm.
- The Manager must be present all the time, or must if absolutely necessary appoint a deputy with responsibility for settling disputes. Courses should not be scheduled at harvest time or other particularly busy seasons.

Pause K:

- Tasks should be rotated between staff to avoid members bribing them. The tests must be closely supervised.
- Calculations must be written down or if calculators are used they must be the type which print out a result. A copy of this must be given to the member.

All grading or other decisions are to be clearly stated and written down in two copies, one of which is retained by the member.

- Cash payments should be avoided in the interests of security, so long as rapid and convenient alternatives are available.

4) Ask trainees to mention any other problems they have experienced in the collection and receiving process, which are not covered in the dialogue or in previous sessions. They may relate to issues such as:

- Lack of trained staff.
- Dishonesty.
- Inadequate buildings or equipment.
- Ignorant members.
- Inflexible, inconsistent and difficult customer demands.

Remind trainees that good management consists of making the best use of what is available rather than complaining about what is not. Stress that some societies succeed in operating far more effective systems, without any greater access to external resources and in the same circumstances as others which are less successful. Staff and members are drawn from the same population. Trainees should follow their example. Imagination, hard work, understanding and goodwill can overcome far more problems than assistance from outside.

Tape Dialogue : The Chaotic Collection Centre

Introducer: The members of the Marrows Maize Society are delivering their crops to the Collection Centre. The collection period has been going on for three days and is likely to last a good deal longer . . . Members have plenty of time to talk to one another and some of the staff seem to have free time also.

(The whole dialogue takes place against a background of thumping sacks, clanging scales, tractor engines roaring and a continual hubbub of people talking and arguing at the same time.)

Absalam: How are you, Saul, I haven't seen you for ages.

Saul: Not bad at all, but I am not very happy with things here at the co-operative. Quite a mess, it seems to me. Still, we've got to put up with it, and the President says that loyalty to our Society will make us rich.

Absalam: Yes, that's what he is preaching all the time. I wish we were allowed to sell our maize elsewhere though., not that I would, but a bit of competition wouldn't hurt these people.

PAUSE A

Saul: How long have you been waiting anyway?

Absalam: Since yesterday morning, I came when they said we all should, but I have just been hanging around every since, I wish they could at least give you some idea when you were going to be dealt with.

PAUSE B

Saul: I know, it's ridiculous, but I only came this morning, I knew they would never work that fast. Apart from this hanging around, I'm glad that my maize wasn't stuck out in the rain last night though, did your stuff all get soaked through?

Absalam: No, luckily I managed to put my little lot in the store, where the maize that has already been received is kept. I think I took the right bags out again this morning, but if not I made sure I took bigger ones not smaller!

PAUSE C

Salim: Alright you people, let us start again. We can't wait all day,
: is this your maize?

Saul: That's right, sir, these ten bags.

Salim: Alright, let's have a look at it. Open up one of the bags.
Mime, looks pretty rough to me, we'll give it 2 1/2 foreign matter and marginally discoloured. I'll just make a note of it.

Saul: What do you mean, "foreign matter", it's all good local stuff, isn't it?

Salim: Never mind about that, we'll take care of the details, now pass along please.

PAUSE D

Saul: Oh well, I don't suppose it makes any difference, now I'll stand in line for the weighing scales, it looks as though it will be two days waiting to have the stuff weighed.

Absalam: You seemed to get through Salim pretty fast, now he's gone away, I suppose I'll have to wait ages for weighing anyway so I might as well wait for him too. Did he give you a note of what he said?

Saul: Oh no, he just wrote it down in his book. Look here it is, I suppose this writing says "2 1/2 foreign matter, marginally discoloured", whatever that means.

PAUSE E

Absalam: I hope they don't try to trick you, do remember what he said even if you don't know what it means.

Saul: That's a good idea. Tell me, did the Society's truck bring your maize up or did you bring it up yourself?

Absalam: No, I had to do it. They said they would call, I had the bags ready at the end of the road, but they never came. They told me in the morning that they waited fifteen minutes at the other entrance, but how was I to know that? I had no idea when they were coming or where.

PAUSE F

Saul: I had better luck, I happened to see the lorry passing and I asked the driver to come to my place. He didn't seem to know where he was actually.

Absalam: Did you have any difficulty at this end?

Saul: No, not really. When I got up here the lorry was standing waiting and the driver said he'd been here for an hour. He said we were meant to be up here before the lorry in order to unload it, but how we were to get here wasn't clear. The Society's labour were having lunch but I got my bags off pretty soon I can tell you.

FA USE G

Abdul: Come on now, we can't wait about all day. Let's have your maize on the scale now.

Saul: Alright, we've been wasting time long enough, a few minutes more won't hurt but here we go.

Abdul: That's enough now, now let's see, that makes 253 kilograms for that lot.

Saul: How many quintals is that?

Abdul: Sorry, we don't deal in old fashioned things any more, it's kilograms or nothing now.

Saul: Well I suppose I'll have to take your word for it. Wait a minute, let me clear this dust off the dial on the scales. It only says 53 kilograms, what's going on?

Abdul: Oh this is a counterbalance, the 200 kilograms weight is on the platform down here.

PAUSE H

Saul: Alright, now let's get them off and the next lot on.

Abdul: That's not my job, I just take down the measurements.

Saul: I see, well, here we go, there's three more bags.

Abdul: That makes 172 kilograms. Wait a minute, what's that little bag over there? That's not an official one.

Saul: Nothing wrong with it, it's what's inside that matters anyway.

Abdul: You're meant to use the official 90 kilogram bags and nothing
i

None to be had anywhere, I was lucky to find this odd lot.

Abdul: Well never mind, this once. That makes six bags, six kilograms deduction, 425 kilograms less six makes 417 kilograms.

Saul: Why are you taking six kilograms off?

Abdul: One kilogram a bag off, that's the rule.

Calib: Now come on over here for the moisture test. Now I'll just take this handful, wait a minute, now, mmm. That's 16.5%. The minimum is 14%, I'm afraid you'll have to take the whole lot back.

Saul: What, take it back, nonsense, I've been here for two days. Anyway why did you only test that little bit, I'll bet that got wet on the top, you'd better test it all.

Calib: Don't be ridiculous, we can't do that.

Saul: Well, I'm not taking it all back again you can be sure of that.

Calib: Alright let's try another bit, that's 15.5%.

Saul: Where's the Manager?

Calib: Oh he's at one of those Co-operative College courses, as usual. It's up to us he said. Off you go now.

PAUSE J

Saul: Well I'm waiting here until the Manager comes back. Absalam it's your turn.

Calib: Thank you for that sample, that's better, 13.8%, no problem there, carry on to the payment desk.

Absalam: Thanks.

(*Aside to Saul*) That's from the sack I took from the pile they'd already accepted, and I gave Calib a good tip last time, he knows who his friends are.

Mughal: Now, let's work this out, the calculator says that's 535 kilograms at 21 cents, that makes \$110 I think.

Absalam: Hold it, I think it's \$112.35.

Mughal: Oh you're right, but we still have to take off 50 cents for the damaged sack. That makes \$111.85.

Absalam: Who says it's damaged?

Mughal: Here's the note from Abdul the checkweighman.

Absalam: He never said anything about it to me.

topic

19

**action programme
and commitment**

SESSION 19

ACTION PROGRAMME AND COMMITMENT

Objective: To enable trainees to apply what they have learned to their own situation, to develop a solution to a specific problem with the assistance of the group and to commit themselves to its implementation by a given time.

Time: Up to one day.

Session Guide:

Trainees should have been warned at the beginning of this course that at the end they would be expected to describe a specific problem facing them when buying produce, and to develop and present a solution to the problem that they will implement on their return home.

They should have been reminded of this constantly throughout the course, and of the need to identify at least one problem which the course will help them to solve. This final day gives them the opportunity to develop a solution to this problem, using what they have learned during the course and in consultation with a number of other trainees, and then to present the solution to the whole group for criticism and comment.

The problems and their solutions will of course be unique to each trainee and his organisation, but typical examples might be as follows

- Problem: We have no fixed, permanent collection centres in our co-operative. For each buying season we announce where the crop will be collected, and we have very many "buying points" for the convenience of our members. Our buying staff are visiting each buying point several times each season, with a truck and a portable weighing machine. They complain about the primitive conditions at the buying points and too much of "travelling time" and "waiting time". I believe that our staff costs and also the leakage during the buying season are unnecessarily high.

- Solution: Introduction of a new collection system. Setting up four permanent collection centres, consisting of a concrete platform and rain shelter with the necessary basic equipment and furniture for the receiving procedures plus facilities for easy loading of trucks. Time plan: cost calculations for the new system as compared with the old system to be presented to the committee in November. Plan to be presented to members at the AGM in December. Construction of new centres January - April next year.
- Problem: The paperwork is too complicated in our Society. In average our clerks need 10 minutes to make the entries and issue the prescribed dockets for each crop delivery. Still the system is not safe, as some members manage to get higher loans than they are entitled to (credit is calculated in the Union Office on basis of delivery documents).
- Solution: A simple system, similar to the one described in this course will be introduced. I will meet with colleagues from three other co-operatives in October to work out the details and then present the system to the Union Manager. I will suggest a trial period during the next buying season. After evaluation and, if necessary, revision of the forms used, the system will be implemented from March next year.

The time available should be divided into two periods - the consultancy period and the presentation period. During the consultancy period the trainees should be divided into groups of 3 to 4 people. The groups should not contain trainees of the same co-operative and ideally should include trainees from different backgrounds. In this period each trainee should be allowed about 30 minutes to present his problem and proposed solution to the other members of the group, who are expected to comment and help develop a solution to the problem, together with a timetable for its implementation.

During the presentation period each trainee should have a least 10 minutes to present his problem and solution to the whole group, and to hear and react to t least a few of their comments. In this brief period the trainees must;

- Describe the problem.
- Describe the solution.

- Describe how the solution will be "sold" to whoever is involved.
- State a specific date by which the plan will be completed.

Trainees who are in a position of authority in a co-operative may feel that it is unnecessary to "sell" their idea to their subordinates. Such trainees should be warned that subordinate staff will contribute more efficiently to the work of the co-operative if they believe what they are doing is useful rather than if they do it out of fear or simple obedience.

The actual timing of the "consultancy" period and the presentation period will depend on the number of participants in the course. Ensure that each trainee has at least 30 minutes to discuss his problem with other trainees in his group and that at least 10 minutes is devoted to a presentation to the full group of course members. In order to ensure that these minimum times are allowed to each trainee the normal session hours should be extended or some time should be allowed during the previous day. The session is important since it provides an effective "bridge" between the course material and the normal environment of the trainees. It also ensures that the trainees regard the completion of the course not as the end of training but the beginning of personal improvement on the job.

Trainees should be encouraged to arrange to meet each other at work after the course for continued "group consultancies". The instructor should also undertake to visit or otherwise contact each trainee around the promised date of completion of the action plan, in order to ascertain whether or not it has been implemented. It must be stressed that this is not in order to evaluate the trainees, but the training course itself.

If possible a brief reunion should also be arranged, to take place after an appropriate interval. If this can be done, trainees should be asked to state in this session exactly what they plan to have achieved by the date chosen for the reunion, so that they can on that occasion compare progress with the stated intention. This is not only a useful evaluation device, but, more importantly, the public commitment and knowledge of the forthcoming reunion will be a powerful incentive to actual implementation.