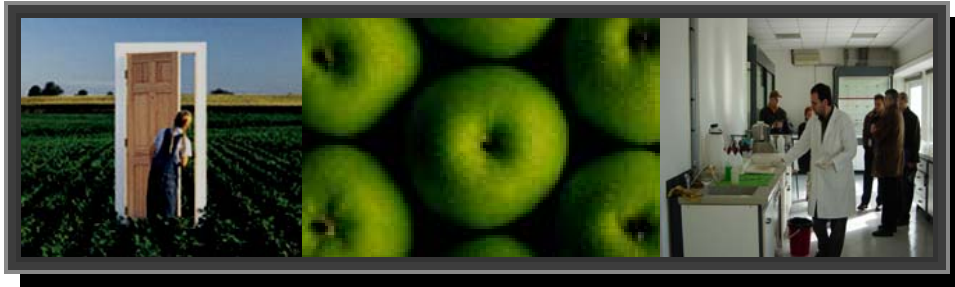


SECTION 6



TRAINING AND EXTENSION

Session 6.1 Horticultural Extension

Key learning points



- The principles of horticultural extension
- Extension methods
- Extension and education
- Extension techniques
- Research-extension linkages

Main objectives of the session

By the end of this session participants will be better able to:



- Understand the basic principles of horticultural extension
- Help to improve grower knowledge and skills, innovation and the adoption of new production, marketing and management approaches
- Provide specific technical advice, training and information on the production and marketing of fresh fruit and vegetables
- Improve their own self confidence and motivation and also that of growers and rural communities
- Develop a dialogue and effective working relationship with growers
- Understand and use appropriate extension techniques
- Organise effective farm visits, study tours, meetings, demonstrations and field days
- Cooperate effectively with other rural development and horticultural research organisations
- Assist in the design and implementation of horticultural research programmes

6.1.1 The principles of horticultural extension

Agricultural, horticultural and rural extension is implemented throughout the world. It is essentially an informal educational process that is directed towards the rural population and is primarily delivered through the provision of advice, training and information. Extension specifically aims to increase the efficiency of agriculture and horticulture, particularly through aiming to increase production and overall farm profitability. However it is also normally concerned, not only with physical and economic achievements, but also with the development of grower families and rural communities. Extension is a process of working with growers and rural communities in order to help to improve their livelihoods. This is a two way process aimed at helping growers to improve productivity but at the same time developing their abilities and confidence to direct their own future. Primarily this is achieved through encouraging growers and rural communities to gain a clearer insight into their own problems and by helping them to determine how to overcome them.

Extension is an educational and developmental process that takes place over a period of time and is not a single training or consultancy activity. Four main elements can be identified within the process of extension:

- ❑ The development of knowledge and skills
- ❑ The provision of technical advice and information
- ❑ The organisation of growers and rural communities
- ❑ The development of motivation and self-confidence

The mix of each element in an extension approach will be determined by the particular circumstances that will sometimes demand prompt and specific information and advice while, on other occasions, more patient development work or grower motivation may be required. An extension service must be flexible enough to enable it to respond to these different demands.

Knowledge and skills

Although growers normally have a lot of knowledge about their own environment and growing system, extension agents should aim to develop this further and in particular toward more specialist areas, such as; the causes of damage to a particular crop, identification of specific pests and diseases plant nutrition or the introduction and application of new technologies.

The application of such knowledge often means that growers have to acquire new skills of various kinds: for example, technical skills to operate unfamiliar equipment, organisational skills to manage a group project, skills for assessing the economic aspects of technical advice given, or farm management skills for keeping records and allocating the use of farm resources and equipment.

The transfer of knowledge and skills to growers and their families is an important extension activity and the extension agent must find out which skills or areas of knowledge are lacking amongst growers in their area, and then arrange suitable learning approaches through which growers can acquire them.

Technical advice and information

Extension should provide advice and information to assist growers to make decisions and take positive action. For example this could be information about e-commerce technologies, prices and markets or about the availability of credit or other inputs. The technical advice should aim to apply directly to improving the production activities or overall profitability of the farm and assist in formulating decisive action. Information must be up to date, accurate and relevant and based upon the findings of reliable research sources.

In many instances growers themselves are also sources of valuable advice and information for other growers, and extension agents should always aim to try to establish and develop a grower-to-grower link.

Grower organisations

As well as providing knowledge, information and technical advice, extension agents can also aim to encourage growers to develop their own organisations that represent their own interests and enable them to take collective action. Extension agents can help to set up, structure and develop such organisations but only in consultation and partnership with committed growers. Grower organisations often make it easier for extension services to work with a larger number of growers and are also able serve as a channel for disseminating information and knowledge or delivering training and advice.

Motivation and self-confidence

A major constraint to development for many growers is isolation or a feeling that there is little they can do to improve their own livelihoods. This is particularly true if they are struggling in difficult circumstances. Motivating growers and helping to improve their self-confidence and ability to take decisions and implement them effectively is an important element of extension work.

6.1.2 Extension approaches

Extension agents work with growers and rural communities and not for them. Only growers and/or people living in rural areas can ultimately make decisions about the way they will farm or live. An extension agent should not try to take these decisions for them, but provide practical and reliable information upon which they can make informed decisions. Supportive advice and training will also help to build self- confidence. Most people have more confidence in programmes and decisions they have made themselves than those that are imposed.

Extension agents are accountable to their clients. On the one hand extension agents are accountable to the managers within the company or government department within which they work and will be expected to follow official policies and guidelines. However ultimately the extension agent is at the service of the growers and rural population and these should have a say in determining how effective extension policies and delivery actually are. Implementation of company or government plans and objectives are often unavoidable but the most important measure of extension effectiveness (for everyone) is the extent to which the incomes and living standards of the rural people have increased as a result of extension work.

Extension programmes should be based around grower and rural community needs, as well as on technical, national or corporate economic objectives. The skill of an extension agent is often to effectively balance them all together.

Extension is a two-way linkage between the grower/rural community and the extension/research agent and not a one-way process in which the extension agent simply transfers knowledge and ideas to growers and their families. Two-way linkages between growers/rural communities and extension/research agents is fundamental to sound extension practice and should be a basic principle of extension activity. Providing information or up to date technical advice, such as that based upon the findings of agricultural and other research stations, is certainly important but a return flow of information from growers to extension and research workers is equally important. Extension agents need to be able to receive ideas, suggestions or advice, as well as to give them.

This two-way flow of ideas can occur at different stages.

- ❑ *When the problem is being defined.* The extension agent can help research workers to understand grower problems in an area and the limitations under which growers have to work. It is even better if an extension agent can bring researchers into direct contact with growers in order to ensure that research recommendations are relevant to needs.
- ❑ *When recommendations are being tested in the field.* A new growing technique or crop variety might produce good results at a research station but may not do so well in the field. Trials on grower fields provide an opportunity to test research recommendations and give useful feedback to researchers.
- ❑ *When growers put recommendations into practice.* Sometimes growers discover problems with a recommendation that the extension agent or researcher has failed to identify. Feedback from growers allows recommendations to be adjusted accordingly.

Extension agents need to cooperate closely with other rural development organisations. Extension is only one aspect of the many economic, social and political activities that seek to produce change for the better in rural society. Extension agents must be prepared to collaborate with all other such organisations, both government and non-government, and to take their views into account when implementing extension policies. Close cooperation with other rural development organisations not only avoids duplication but also provides opportunities for integrated programmes. The kinds of organisations with which extension services may need to cooperate include:

- ❑ *Political institutions and local political leaders*
- ❑ *Commercial companies*, such as those which supply agricultural or other inputs, credit facilities or marketing services and are able to provide specific advice and training.
- ❑ *Quality assurance, health service and certification bodies*
- ❑ *Chambers of commerce and trade associations*
- ❑ *Local schools and agricultural colleges*

- *Community leaders* that can help in breaking down local social and cultural barriers to change and can encourage community action programmes.

Extension agents work with different target groups and are able to recognise that not all growers in any one area will have the same problems. For example, some will have more land than others or will be keen to try out new ideas, while others may be more cautious. Extension agents cannot offer a single "package" of advice, suitable to all growers. Different groups need to be identified and the agent will have to develop programmes appropriate to each group.

Extension effort is sometimes concentrated on the progressive grower who is expected to spread new ideas to others. However, this does not always work, because progressive growers often have different problems and issues to tackle. Extension agents therefore need to be aware of the existence of different groups and plan programmes accordingly.

6.1.3 Extension and education

Growers and their families need to learn new skills, knowledge and practices in order to improve their growing and other productive activities. As they do so, they develop new attitudes toward growing and new technologies as well as towards extension itself. This in turn influences their future behaviour. Similarly extension agents must also be prepared to learn from growers and keep themselves up to date with relevant developments in agricultural technologies and approaches. In educational work the extension agent should be aware of a number of principles of learning and in particular that *the educator must also be a learner*.

Education is not a process of filling empty minds with knowledge. Growers already have a lot of knowledge about their environment and about their farming system. They would not be able to survive if they did not. Extension agents must build on the knowledge that already exists and be able to learn as well as to teach. Extension agents will need to find out what growers already know as well as what they don't.

Learning requires motivation and no one can compel another person to learn. There has to be a desire to learn and often adults find it more difficult than children to grasp new ideas and information. Unlike a schoolteacher an extension agent does not have a captive audience and growers can choose whether to listen or adopt new ideas. They are most likely to do so if they feel that the learning will result in their being able to satisfy a need or want such as improving their livelihoods or being well thought of by their neighbours. A grower who is motivated is likely to learn much more rapidly and completely than one lacking motivation.

Dialogue and practice are important for learning and growers rarely learn much from lectures and most of what they do hear they may soon forget. Much more information is retained from allowing questions, enabling discussion and testing theory in practice. In this way the extension agent can also help to correct any initial mistakes or misconceptions and growers gain more confidence in using new approaches.

Learning and adoption occurs in stages. Before a group of growers will decide to try out a new practice, they must first learn of its existence. They may then have to learn some new skills. Five stages can be identified in the process of accepting new ideas.

- *Awareness*. A grower learns of the existence of an idea but knows little about it

- *Interest.* The grower develops an interest in an idea and seeks more information about it, from either a friend or the extension agent
- *Evaluation.* The grower evaluates the idea and the potential benefit to them. They will assess its appropriateness and may seek further information or go to a demonstration or meeting, before deciding whether or not to try it
- *Trial.* Very often, growers will decide to try the idea on a small scale. For example, they may decide to place manure or fertiliser on a small part of one field and compare the result with the rest of the field. To do this they often seek advice on how and when to apply fertiliser or manure
- *Adoption.* If growers are convinced by a trial, they are likely to accept the idea fully and so it becomes a part of their customary way of farming

Although often more complex and it may take longer, similar stages of adoption are involved with grower groups and even whole communities. The extension agent will need to use a range of extension methods to bring the right kind of information and support to each stage of the process and then arrange learning experiences that will lead people from one stage to the next.

Growers will differ in their speed of learning and adoption. Not all growers will accept a new idea at the same time. The readiness of any grower or rural community to accept new ideas and put them into practice will vary from person to person and depending on their own previous experience with the new ideas as well as their personality and the amount of land or other resources available. We can identify different categories of growers in terms of their abilities to adopt new ideas.

Innovators are growers who are eager to accept new ideas. There are usually only a few people in this category. In horticulture they are often growers that have spent some time away from their farm or are new to a community. Innovators are often looked upon with suspicion and jealousy, but they are important to the success of an extension programme since they can be persuaded to try new methods and thereby create a wider awareness of a technique or approach. However, an extension agent often needs to exercise tact and caution, in order to avoid over-praise and resulting in rejection of an idea by the rest of the community.

Early adopters are more cautious growers than innovators and want to see an idea tried and proved under local conditions before implementing. These growers generally express an early interest but must first be convinced of the direct benefit of the idea through demonstration. Usually this group of growers include local leaders and others who are well respected in the community.

The majority of growers adopt a new idea more slowly and sometimes less completely. Many growers may lack the resources to adopt a new idea at all, while others may only do so slowly and with caution. The majority who can and do adopt ideas are likely to be more influenced by the opinions of local leaders and neighbours than by the extension agent or by demonstrations.

6.1.4 Extension techniques

Two common extension methods can be adopted:

- A) *The individual method*, in which the extension agent deals with growers on a one-to-one basis
- B) *The group method*, in which the extension agent brings growers together in one form or another in order to undertake their extension work

Each of these methods demands different approaches and techniques on the part of the extension agent and the two methods are suited to different purposes. It is important for an extension agent to consider the range of individual and group methods at their disposal and to select the method most appropriate to the situation. It is also important to remember the educational role of extension work and to ensure that the method selected is used to promote a better understanding of the technology involved. Both individual and group extension methods involve the extension agent in a face-to-face relationship with the grower, and this relationship needs to be one of mutual confidence and respect. The extension agent will therefore need to think carefully about their use of individual or group extension methods in order to ensure that their relationship with a grower is properly developed.

Individual methods of extension are probably the most universally used extension method. The extension agent meets the grower on the farm and discusses issues of mutual interest and provides both information and advice. The atmosphere of these meetings is usually informal and relaxed. The grower benefits from individual attention and the extension agent receives useful feedback. Individual meetings are probably the most important aspect of all extension work and they are invaluable for building confidence between the extension agent and the grower.

Although group methods enable extension agents to reach a much greater number of growers, learning in particular is an individual process. The personal influence of an extension agent can be a particularly critical factor in helping growers to take difficult or important decisions. Individual contact between extension agents and growers can take a number of forms and each of which are considered below:

Farm visits are the most common form of personal contact between an extension agent and a grower and may be more than 50% of extension activities. Because they take up so much time, it is important to be clear about the purpose of each visit and to plan them carefully. Farm visits can:

- ❑ Familiarise an extension agent with a grower and their family
- ❑ Enable specific advice or information to be provided
- ❑ Build up an extension agents knowledge of the area and of the kinds of problems that growers face
- ❑ Permit an extension agent to explain new recommended practices or to follow up and observe results to date
- ❑ Create a general interest amongst growers in a particular technique and stimulate their involvement in extension activities.

Office calls. Just as an extension agent may visit a grower, a grower may visit the extension agent. This requires:

- ❑ Ensuring that access to an extension office is possible and it is easily found, promoted and signposted
- ❑ A notice-board and information display to be made available and with useful and up-to-date information
- ❑ Sufficient chairs and tables and other facilities to be available for meetings.

Letters and E-mails. Occasionally an extension agent will correspond with a grower by letter or increasingly by E-mail. This can be in order to provide information or specific technical advice or in order to follow up an enquiry. Responding quickly to requests for support is an important task for an extension agent.

Telephone calls and SMS messaging. If the telephone is used it should not be for long discussion but for passing on specific advice or information. Whatever the reason, it is important for the agent to speak clearly, to note the main points discussed and to enter them in a growers record. For specific advice, such as on daily prices, a cheaper method is to use SMS messaging systems that are available on most mobile telephones.

Informal contacts will occur continually during the work of an extension agent, either during visits to other growers, at meetings and even in the local supermarket. These contacts help to further develop trust between growers and the extension agent and enable ideas and information to be passed on in a much more informal environment.

Group methods of extension have become more common over the past decade and a number of new ideas have emerged about how groups may be used most effectively. Individual extension methods can be costly in both terms of time and scarce extension resources, and sometimes only reach a limited number of growers. There is also the danger that too much emphasis upon individuals can lead to an undue concentration on the more progressive and larger growers. Group methods offer possibilities for greater extension coverage and are therefore more cost-effective. Using group methods an extension agent can reach many more growers

Extension groups also offer a more reflective learning environment in which a grower can listen, discuss and decide upon their involvement in an extension activity. The support of a group can help an individual grower to make decisions and determine a course of action. The group can create a supportive atmosphere, and individual growers can gain greater self-confidence by joining others to discuss new ideas and try out new practices.

The group method can also bring together growers with similar problems. Often, these problems may demand concerted action, and such action might sometimes be taken more effectively by a group than by an individual that is overwhelmed by the enormity of certain problems.

It is not sufficient for the extension agent simply to bring growers together for a particular activity. Four main issues will need to be considered:

What is the purpose? Primarily this will be either to:

- ❑ Encourage the growers in the group to exchange information on a regular and ongoing basis
- ❑ Use the group to transmit new ideas, information and knowledge that will assist growers in their activities

What should be the size of the group? The most suitable size for groups in rural extension is between 20 and 40 members.

Who should comprise the membership? It is better to work with growers with similar backgrounds and common problems.

What should be the extension agent's relationship with group? The agent will need to give considerable thought to this. Ideally, they will want to encourage the formation of the group and to help in strengthening it.

A number of group extension methods may be employed:

Group meetings are the most common method and involving a group of growers or rural inhabitants. These meetings may be:

Information meetings where the extension agent calls the group or community together in order to communicate a specific piece of new information and to receive feedback.

Planning meetings with the main purpose of reviewing a particular problem, suggesting a number of solutions and deciding upon a course of action.

Special interest meetings covering topics of specific interest to a particular group of growers, such as on apples or strawberries.

General community meetings involving a number of members of the community and discussing issues of general community interest. These are particularly useful in avoiding any feeling within the community that certain members are excluded from extension activities.

Demonstrations are particularly useful in showing growers how a new idea works and also the effect it can have on increasing crop production. A good, practical demonstration is an invaluable method in extension work and a particularly powerful method to use with growers who do not read easily. A demonstration gives growers the opportunity to observe, at first hand, the differences between a recommended new crop practice and those that they normally undertake. At an open day the difference between two batches of crops can make a vivid demonstration of the validity of the recommendations. Photographs should be taken to demonstrate the differences in future years. The strength of the demonstration should lie in its simplicity and its ability to present growers with concrete results.

There are two principal types of demonstration used by extension agents - method demonstration and result demonstration.

Method demonstration basically shows growers how to do something. In the method demonstration, the grower is shown step by step how, for example, to plant seeds in line, to use a mechanical duster to control insects, or to prune trees. The extension agent will probably be dealing with growers who have already accepted the particular practice being demonstrated, but who now want to know how to do it themselves.

Result demonstrations show local growers that a particular recommendation is practicable under local conditions. Comparison is the important element in a result demonstration. By showing tangible results of a new practice recommended by the extension service, the agent can help to create confidence amongst growers and can greatly encourage them to try the practice themselves.

An extension agent should never contemplate holding a demonstration without *careful planning and preparation*. Before an extension agent begins to plan and prepare for a demonstration, they need to be clear on a number of key points that will guide the preparation and handling of the demonstration.

Where possible, demonstrations should be carried out on local farms with the *participation of growers* rather than on an extension plot or research station. *Simple, clear-cut demonstrations* of a single practice or new idea will be far more effective than ambitious and over-complex demonstrations that demand too much of the grower. The demonstration provides a *learning environment* and should be run in such a way that growers do in fact learn something.

Field days are usually opportunities for holding method or result demonstrations on a slightly larger scale, and are usually run in a more informal and less structured manner. The purpose is often to introduce a new idea and a new crop, and to stimulate the interest of as many growers as possible. Experimental stations may be used for field days, but it is more usual and profitable for them to be held on the land of a local grower. There is a greater chance of making an impact if a grower plays a part in running the field day and explaining its purpose.

Tours. Many growers like to visit farms in other districts to see how they work, to see what they grow and to discuss what kinds of problems other growers are facing. A tour is a series of field demonstrations on different farms, or at different centres, and can often attract a lot of interest. Tours should give growers a chance to see how others cultivate their land, and to enable exchange of ideas and experiences. A field tour is an ideal method of stimulating genuine interest in extension activities. It is also very useful in bringing growers together to discuss common problems, and to gain useful experience of other areas.

6.1.5 Research-extension linkages

The only true measure of the impact of a research institution is to see how well its research findings are received by growers. This necessitates linking research with extension. Neither research nor extension can fulfil their responsibilities without each other. Hence good communication, strong interaction and effective collaboration are primary requisites. Technology transfer is central to both groups and their operations are inter-dependent. If a particular technology is thrust upon a locality and extension agents are forced to promote it although it does not suit the local agro-ecological or socio-economic conditions, failure of such technology will cost the extension agent the goodwill of growers.

By working closely together two major concerns can be overcome; firstly that research is not in accordance with the priority needs of producers and secondly that the results of research have not been effectively transferred to growers.

Strong links between research and extension can be developed by jointly formulating research agendas that are based on problem identification, and developing technology

suitable for the prevailing socio-economic and ecological environment. Extension agents provide a useful role in disseminating research information and facilitating interaction between researchers and growers.

Agricultural and horticultural research institutions usually concentrate their effort on strategic research and technology generation. Some efforts towards technology piloting testing are also made. However, technology integration and production activities should not be neglected if critical linkage problems are to be avoided at the technology production, testing and integration stages.

In the absence of clear directions, research or extension agents will concentrate their effort on activities that, in their judgment, are considered the most important and influenced principally by their background, experience and training. Research agents often consider strategic research and technology generation to be their main responsibility while extension agents consider technology production and dissemination to be key. However, linkage activities cannot be performed in isolation and they require coordination of personnel from both functions.

Since research and extension agents have complementary roles in horticultural development, the success of each group may be partly determined by the effectiveness of linkage activities. Even where the research and extension functions are located within one institution, linkages between them may not be automatic. Therefore, appropriate mechanisms to strengthen linkages need to be developed. The following table outlines some approaches to research/extension mechanisms and common reasons for inadequate linkage.

TABLE: Research /extension mechanisms and causes of inadequate linkage

MECHANISM	
STRUCTURAL	MANAGERIAL
<input type="checkbox"/> Combining research and extension functions into one unit	<input type="checkbox"/> Redefining job descriptions to strengthen relationships
<input type="checkbox"/> De-centralising research and extension activities into regional activities	<input type="checkbox"/> Establishing joint reviews of research and extension activities
<input type="checkbox"/> Fielding subject-matter specialists in extension	<input type="checkbox"/> Improving individual incentives (personal, professional and financial) for collaboration
<input type="checkbox"/> Starting extension liaison positions in research institutions	<input type="checkbox"/> Exchanging personnel resources, e.g., posting extension staff into research organisations
<input type="checkbox"/> Establishing communication-cum-information departments	<input type="checkbox"/> Jointly training for expanded roles in a technology system
<input type="checkbox"/> Developing Agency agreements for collaboration	<input type="checkbox"/> Jointly using of facilities and services, e.g. soil testing, demonstrations

<input type="checkbox"/> Redefining roles and responsibilities between research and extension units	<input type="checkbox"/> Promoting informal linkages
<input type="checkbox"/> Creating inter-agency committees or councils	<input type="checkbox"/> Exchanging information using jointly developed protocols
<input type="checkbox"/> Developing inter-agency agreements for collaboration	
<input type="checkbox"/> Physically locating research units adjacent to extension units	
<input type="checkbox"/> Providing for grower participation in research activities	
<input type="checkbox"/> Liaising with private and non-governmental organizations	
CAUSES OF INADEQUATE LINKAGE	
A. STRUCTURAL AND ORGANISATIONAL PROBLEMS	
<input type="checkbox"/> No one is assigned to perform functions such as adaptive research or to provide feedback to researchers	
<input type="checkbox"/> Linkage activities are simply assigned to a specific institute or department, or divided in such a way as to reduce effectiveness	
<input type="checkbox"/> There is excessive centralisation or de-centralisation	
<input type="checkbox"/> There is insufficient authority that is able to ensure that institutions coordinate their activities and perform their responsibilities	
<input type="checkbox"/> There are institutional incompatibilities, such as research by commodity and extension by region; different clientele; or different time schedules for planning and budgeting	
B. MOTIVATION AND INCENTIVE PROBLEMS	
<input type="checkbox"/> Individuals may have little incentive from management to perform linkage functions	
<input type="checkbox"/> The maintenance of institutional autonomy may over enforced	
<input type="checkbox"/> Rewards for journal publication may be higher than for technology transfer activities	
C. RESOURCE PROBLEMS	
<input type="checkbox"/> Financial resources may be scarce for linkage functions such as publications, testing of research results or training of extension staff	

Human resources may be overloaded and unavailable for linkage functions

D. COMMUNICATION PROBLEMS

Value systems, educational backgrounds and communication patterns may differ widely between researchers and extension agents

Physical means of communication may be weak or non-existent in critical areas

Source: Based on Kaimowitz, D. 1987