

LEARNER GUIDE

Production Management

Level 2

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Applied Title:		Define and Understand Citrus Production Systems and Citrus Production Management					
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Directions

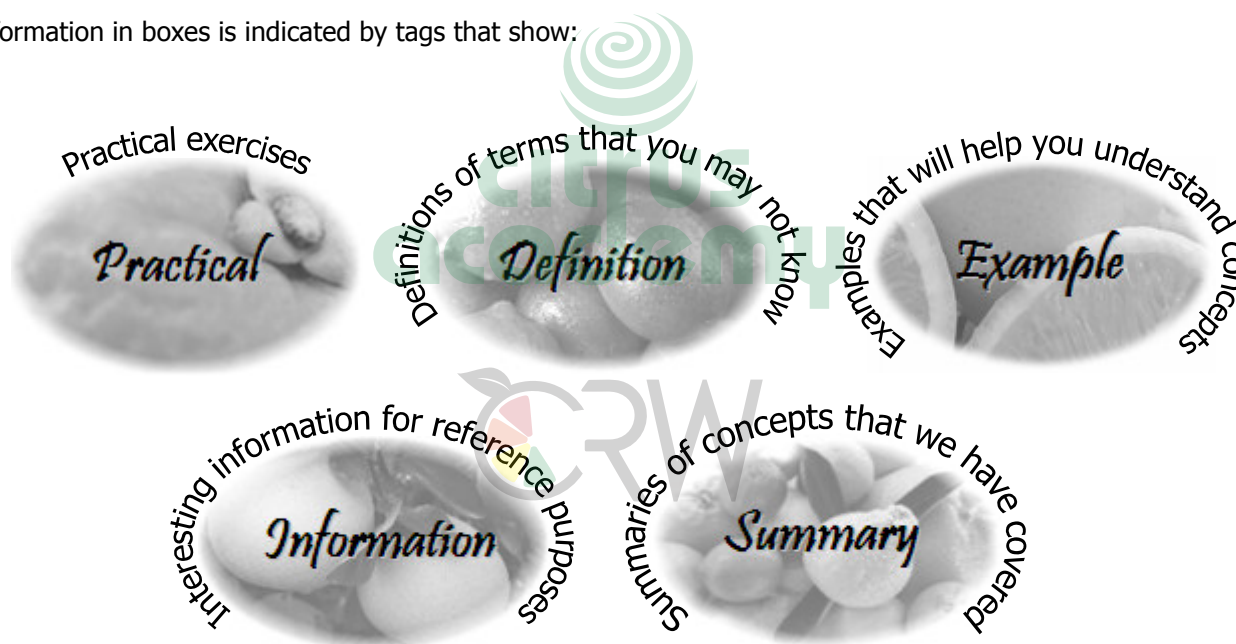
This learning material has been developed to assist the learner wishing to complete this unit standard. The guide contains all necessary learning to ensure that the learner will attain the competencies required by the unit standard.

The learner guide is accompanied by a Learner Assessment Guide. Please ensure that you have access to this guide as well.

The learner guide was designed to be used by a learner during the presentation of a skills program based on the unit standard, and to be kept afterwards by the learner for reference purposes. The learner assessment guide was designed to be completed during and after the presentation of the skills program, and forms part of the assessment process.

Although this learner guide contains all the information required for attaining competency in this unit standard, references to additional resources, both printed and electronic, are provided for further study by the learner.

Information in boxes is indicated by tags that show:



Introduction

1. **Purpose**

The learner achieving this unit standard will be able to understand basic production systems, the basic managerial tasks, additional management tasks and the management objective in the agri-business environment. In addition they will be well positioned to extend their learning and practice into other areas of business and agriculture, benefiting agriculture by placing managers that are trained to understand that agricultural production is a business.

Learners will understand the importance of the application of business principles in agricultural production with specific reference to production/conversion.

They will be able to operate farming practices as businesses and will gain the knowledge and skills to move from a subsistence orientation to an economic orientation in agriculture. Knowledge and skills to access mainstream agriculture through a business-orientated approach to agriculture will be gained by farmers.

2. **Learning Assumed to Be in Place**

It is assumed that the learner has successfully completed the unit standards listed below:

<i>NQF Level</i>	<i>Unit Standard Number</i>	<i>Unit Standard Description</i>
1 (ABET 4)	Literacy and Numeracy	
1	116165	Define production and understand the basic activities of production/conversion in the agri-business environment

1. Introduction

2. Background

Consumers want the fruit of their choice to be available at all times. Fruit should look good, be unblemished, well-coloured (superior exterior quality), taste good (high interior quality) and be of the right size. At the same time, the citrus producer wants orchards that will provide high yields over an orchard lifespan of 18 to 30 years. On top of all this, the citrus orchard must be managed in such a way that production practices have the least possible impact on the natural environment. Commercial citrus production management is about achieving these objectives efficiently and cost effectively.

3. Citrus Planting

Once planted, trees take three or more years before bearing fruit that can be marketed. Thereafter, per tree and per hectare yields steadily increase to 40 to 70 t/ha – depending on cultivar and variety – after a further 4 to 7 years. If the trees are well looked after, this level of production will remain fairly constant until trees start to decline naturally.



Yield

Yield refers to the amount of fruit produced, and can be expressed in terms of:

Tree yield	kg per tree	kg/tree
Orchard yield	tons per hectare	t/ha
Export yield	15kg carton equivalents per hectare (10kg carton equivalents for soft citrus)	cartons/ha

4. Lifespan

The average economic lifespan of a commercial citrus orchard varies between 18 and 30 years, and can be as high as 30 to 60 years in hot, dry areas. Citrus is therefore viewed as a long-term crop. For citrus production to be profitable, the orchard must produce high yields of quality fruit every year, and do this consistently over a long period of time.

In citrus production the challenge is therefore to make production decisions and take actions to ensure high annual production of marketable fruit, while ensuring that these decisions and actions contribute to the long-term sustainability of the orchard.

5. Citrus Plant Phenology

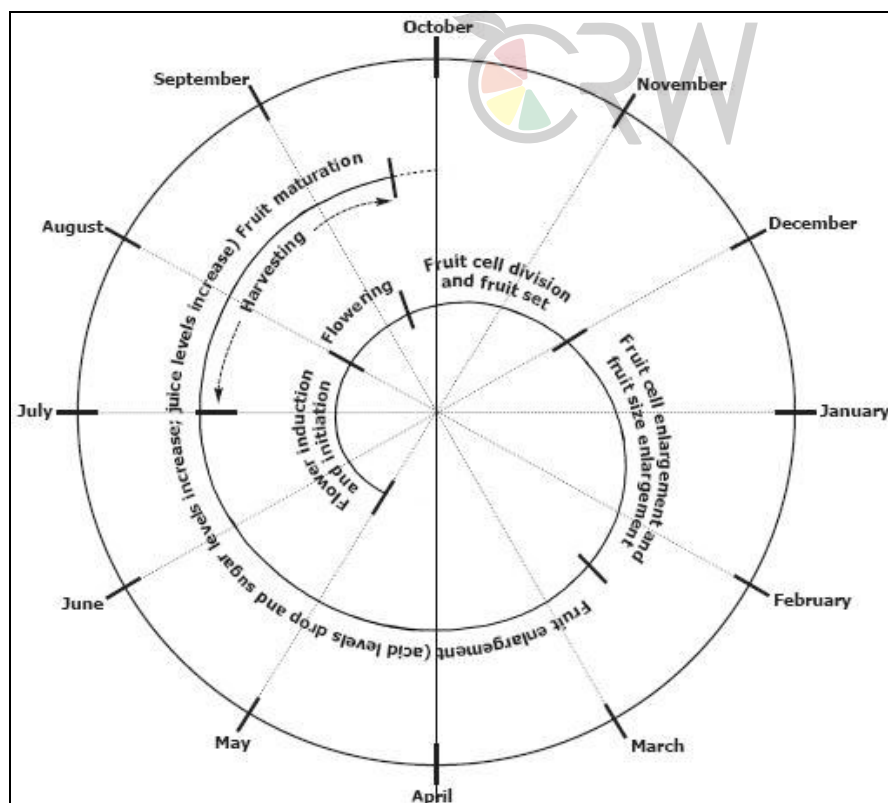


Phenology

Phenology refers to regularly recurring biological phenomena and the environmental and climatic factors that influence them. In citrus, phenology specifically refers to the annual cycle of the citrus tree.

Understanding the phenology of the citrus tree is essential to understanding the reasoning behind many of the practices and actions employed in citrus production. For example, the timing of fertiliser applications is linked to the phenology of the tree, with most fertilisers being applied at appropriate times to optimise flowering, fruiting, fruit development and fruit maturation.

The figure and table below set out the annual cycle of the citrus tree with regard to fruit production. Please note that this figure and table reflect the approximate flower and fruit development cycle of a valencia orange tree, and that the phenology of various cultivars differ.



<i>Stage</i>	<i>Description</i>	<i>Time Period</i>
Flower Induction and Initiation	Flower initiation is the induction and differentiation of vegetative buds into flower buds at a cellular level, and cannot be seen with the naked eye.	May to July
Flowering	Flowering or "bloom" is when blossoms appear on the tree.	August to Mid-September
Cell Division and Fruit Set	Cell division is the period when cells making up the fruit increase in number. Fruit set is the period from flowering or "bloom" until the end of fruitlet drop, after which the final fruit load is determined.	Mid-September to November
Cell Enlargement and Fruit Growth	Cell enlargement is the period during which cells making up the fruit increase in size. Fruit growth is the period during which the fruit grows and develops.	December to Mid-February
Fruit Maturation and further Fruit Growth	During this period fruit enlarges further and matures internally, meaning that the flavour, sugars and acids reach their optimum levels.	Mid-February to September
Harvest		July to September

It is important to note the term **citrus season** refers to the period from when flower initiation begins to the harvest. The season is generally from the beginning of August of one year to the end of July of the next year, although harvesting may extend to September and October for late cultivars.

6. Citrus Learning Material

The following citrus specific learning material is available from the Citrus Academy:

<i>Skills Area</i>	<i>Description</i>
Enterprise Selection, Planning and Establishment	Concerns itself with identifying the various components of an agricultural enterprise, and with the selection and planning processes for a new enterprise, and looks at the physical layout of a farm, with specific reference to infrastructure, orchard layout, etc.
Propagation	Concerns the various methods and requirements for the multiplication of plant material of specific varieties that possess desired qualities.
Crop Establishment	Concerns the establishment of a new citrus orchard, in terms of the physical planting of trees and the care for young trees.
Plant Structures and Functions	Considers the structure and function of various plant parts and the manner in which nutrients, water, air and sunlight is taken up and processed.
Plant Nutrition and Soil Management	Concerns itself with plant nutrients, in terms of the requirements of the citrus plant and the supplementation of nutrient elements through fertilisation, with specific reference to the timing and manner of application.
Water Quality	Considers the various factors that influence water quality and manners in which water quality can be measured and controlled. Considers furthermore the effect of water quality on tree and fruit growth and development, in combination with effective irrigation, fertilisation and pest control.

<i>Skills Area</i>	<i>Description</i>
Plant Manipulation	Concerns various types of physical and chemical plant manipulation, with specific reference to pruning, girdling and the application of plant growth hormones, and tools and equipment used for this purpose.
Irrigation	Looks at the technical aspects of orchard irrigation, with reference to the types of irrigation systems, the installation of new irrigation systems, and the repair and maintenance of an irrigation system. Also concerns irrigation scheduling, and measures to ensure effective irrigation.
Pests, Diseases and Weeds	Concerns the identification of pests, diseases and weeds that threaten citrus production. Also considers various methods of effective control, and the planning required for this purpose.
Crop Protection	Looks at the practical application of crop protection agents through various methods, with specific reference to tools and equipment used, and health and safety requirements.
Food Safety	Concerns the requirements in terms of health and safety, and environmental control for ensuring food safety and hygiene.
Harvesting	Looks at the process of determining fruit maturity through maturity indexing, the harvesting of fruit, and the tools and equipment used for this purpose.
Conservation	Considers the impact of farming practices on the environment, with reference to the measures required to minimise this impact and protect the environment.
Marketing	Concerns the factors influencing citrus marketing, and the development of an effective marketing plan.
Production Management	Concerns the actions and processes involved in effective production management, with specific reference to the coordination of the various production tasks and processes and the creation of a strategic plan for the enterprise.
Industry Overview	An overview of the citrus industry and the various institutions involved.
Packhouse Practices	Concerns the specific principles and practices that are employed in Packhouse environments, and specifically: • Receiving • Sorting • Grading • Fruit Sizing • Cold Chain Management • Packing • Palletising • Storage • Dispatch • Fruit Markets • Fruit Quality • Fruit Treatment • Health and Safety • Hygiene • Product Characteristics

Chapter 1

After completing this chapter, the learner will be able to:

Understand production systems in an agri-production environment

1. Introduction



Production Practices

Production practices are the actions and processes carried out to achieve production objectives, such as fertilisation, irrigation, pest and disease control, pruning, harvesting, etc.

Production Systems

Production systems are concerned with the production practices required to **convert resources** into a desired **product**, which in this case is a marketable citrus crop.

Production Management

Production management is the management of production systems and production practices.

Production Objectives

Production objectives are measured in terms of yield (volume), export percentage, number of export cartons per hectare, fruit size, and external and internal quality.

Production systems involve the use of a variety of **production practices** that are employed to produce a crop of the highest possible standard in terms of quantity, quality and size, in order to achieve **production objectives**. Coordinating the production systems requires effective **production management**.

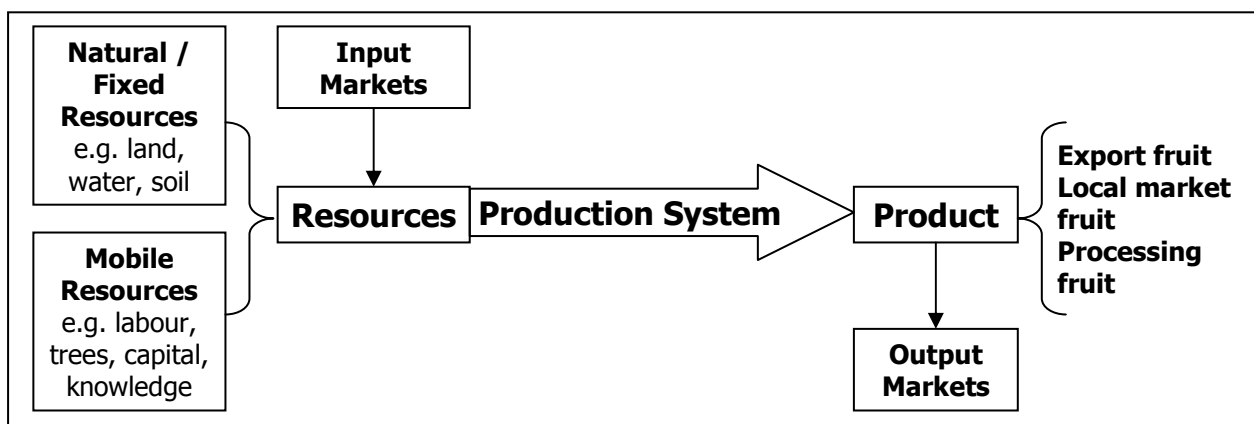


Figure 1.1: Production Conversion

Figure 1.1 demonstrates the conversion process involved in citrus production, where resources (inputs) are converted by a production system to a product, being citrus fruit (output).

2. Market Interaction

Figure 1.1 demonstrates the interaction with input and output markets. Inputs (resources) are obtained from input markets, while products are sold in output markets. The production manager stays on top of the latest developments in input markets by consulting technical extension officers, attending study group meetings, and reading appropriate magazines and journals.

Knowing the output market is essential. The requirements of consumers, wholesalers and retailers (market demand) determine many of the decisions that are taken in respect of production practices. Getting the highest possible return for the citrus that is produced will ultimately determine the commercial success of the farming operation.

In South Africa, about 60% of commercially grown citrus is exported as fresh fruit. Of the balance, about 25% is sold on the local market and 15% is sent for processing at juice factories. Yet over **90%** of total **revenue** is generated from **exports**. For this reason, production practices are geared toward maximising the export pack-out percentage and export cartons by ensuring that the requirements of foreign consumers are met.

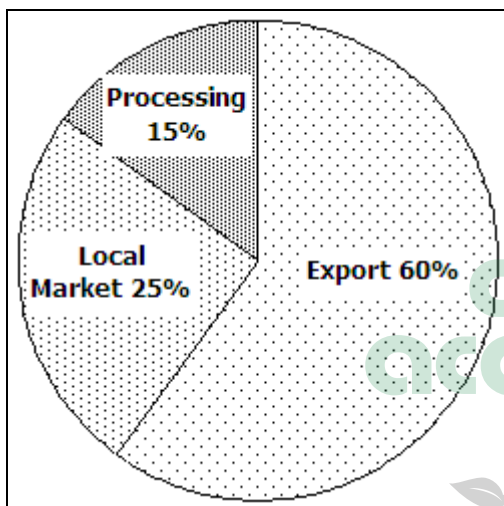


Figure 1.2: Citrus Sold per Market Segment

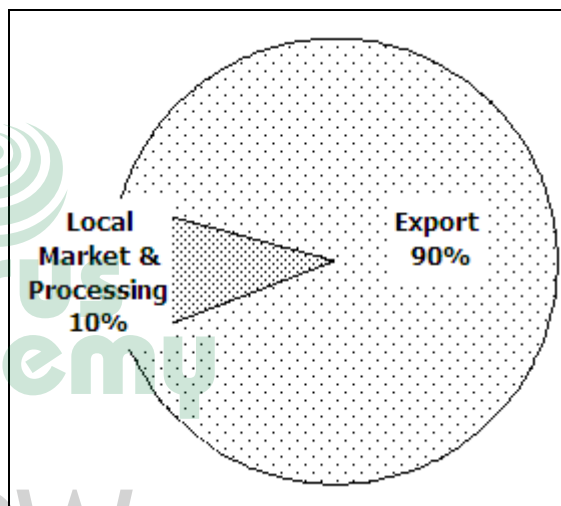


Figure 1.3: Income per Market Segment

Definition

Export Pack-out Percentage

Export pack-out percentage means the percentage of total fruit produced that can be exported. If a total of 1,000 tons are produced and 600 tons (40,000 15kg cartons) are exported, then a 60% export pack-out percentage is achieved.

A production manager must ensure that he stays on top of all the latest developments on the international market. This information drives the decisions he takes regarding all aspects of production, from cultivar selection, to the selection of chemicals, to the timing of the harvest. All these decisions are strongly influenced by market demand. Increasingly, the higher paying markets are insisting that producers demonstrate their knowledge of and compliance with environmental regulations. These regulations are in some cases legally enforceable and in other cases set as entry requirements to output markets.

Good agricultural practices (GAP) regulations aim at meeting consumers' needs for products that are of high quality, that are safe to eat, and that are produced in an environmentally and socially responsible way. Producers who apply GAP would minimise the use of chemicals to prevent harming the natural environment. This process is commonly known in the industry as Integrated Crop Management.

3. Resources

Resources include those inputs that are fixed in relation to a particular site, such as land and water. These are known as natural resources, while mobile resources include labour, capital, trees and knowledge. (Refer to figure 1.1.)

Natural resources are, by definition, limited. More land or more water cannot be produced, and available natural resources must therefore be treated with respect if the farming operation is to be successful. The availability of these resources to meet the long-term needs of the enterprise is of critical importance.

The potential of a certain site for citrus production depends on its climatic suitability for the varieties to be grown and the status of the fixed or natural resources, specifically the availability of sufficient high quality water and suitable soil. All resources come at a cost and the scarcer the resource, the higher the cost. Land and water are scarce, expensive, and have to be used efficiently.

Only about 13% of South Africa's surface area can be used for crop production, which is referred to as arable land. Only 22% of this area is considered to be high-potential arable land. Suitable land is the primary fixed resource and without it, nothing can be produced. Land is suitable for citrus production if it:

- Is of sufficient size to support the required plantings;
- Is located in the right climatic area to support desired varieties;
- Is located in the right climatic area to result in low pest and disease pressure;
- Has sufficient areas of soil of the required type and quality;
- Has a sufficient supply of high quality water;
- Is located close to sources of skilled and unskilled labour; and
- Is not too far from packing and transport facilities

4. Production Practices and the Environment

It is not possible to produce a citrus crop to meet market specifications without applying certain practices or interventions. This is because the planting of large areas to a single crop upsets the natural balance in the first place. The farmer finds himself in competition with nature. A source of food which did not exist before is created for various pests and diseases. Furthermore citrus trees have to be manipulated in various ways to bear high yields of uniformly sized fruit of the desired quality. The challenge facing the production manager is therefore to:

- Achieve yield targets;
- Ensure the products meet market quality specifications;
- In such a way that the process is sustainable; and
- Within the framework of Good Agricultural Practices

Environmentally speaking therefore, production must be managed in such a way that the processes can be used repeatedly throughout the lifespan of the orchard and beyond. This is achieved by minimising the use of harmful production practices and applying those that have minimum negative impact on the environment. Examples of such production practices include:

- Selecting varieties best suited to the environment and climate;
- Using certified nursery trees;
- Using pesticides with minimum impact on non-target insects;
- Minimising the use of soil tillage equipment; and
- Accurate and targeted use of fertilisers
- Responsible use of water

Production practices are costly and some, especially broad-spectrum pest and disease control treatments, inorganic fertilisers and herbicides, can contaminate soils and run-off water. This causes pollution of the environment and reduces populations of beneficial insects.

Production practices should therefore be carefully managed to achieve the desired production objectives with minimal harmful effects to the environment.

5. Optimal Usage of Resources and Optimisation of Outputs

Resources, which as mentioned above include both natural and mobile resources, need to be deployed in an effective manner. This means avoiding wastage, duplication and incorrect resource application and timing. For example, water, which is a scarce resource, should be applied at the right times and in the right amounts. To achieve this may require that other resources, such as the soil, be properly selected and prepared and that the labour – another important resource – used to apply the water be adequately trained.

Resources can also be underused. For example, the establishment of a new a citrus orchard requires adequate capital to be available for the purchase of high quality trees, an effective irrigation system and the required equipment. Capital is a resource which, if not available in a sufficient amount, can lead to an under-capitalised venture and ultimate failure.

In addition to the effective use of resources, appropriate systems, processes and procedures, that enable the achievement of highest income at lowest cost, must be put in place. The highest income is achieved when resources are cost-effectively applied to optimise orchard production and, in so doing, also enable the greatest possible proportion of fruit to meet the demands and requirements of the best paying markets, in this case the export market.

Chapter 1

- Production systems is about using production practices to convert resources to products that acceptable to the market, in other words to achieve production objectives.
- Production management is about coordinating production systems.
- Meeting market requirements consistently ultimately determines the success of the farming operation. The export market is the most important in citrus production.
- Resources are either fixed (natural) or mobile.
- Fixed resources are expensive and limited.
- Citrus farming implies being in competition with nature, and agricultural practices must always be such that it has a minimal impact on the environment, while still achieving the required yield and quality targets.
- Resources, especially limited natural resources must be employed optimally.

Complete activities 1 and 2 in the **Learner Workbook**.

Chapter 2

After completing this chapter, the learner will be able to:

Understand and define the basic managerial tasks

1. Introduction

Managing a citrus production unit is similar to managing a complex project, in that the following steps must be followed:

- Define, understand and clearly state the overall goal or objective of the operation or project, for example define the standards to which the end product has to comply;
- List the actions needed to achieve the end result, including naming the individuals who are responsible for the work and the deadline dates by when the various tasks have to be completed;
- Define ways of evaluating and measuring progress and use results of this constant review process to influence future planning and operations.

The basic managerial tasks that are required to execute these steps are:

- Setting objectives
- Planning
- Scheduling
- Organising
- Implementation
- Coordination
- Monitoring

Successful citrus production management depends on the effective application of standard management principles and practices. This chapter identifies these aspects, defines them and describes their key features.

2. Setting Objectives

Setting objectives is concerned with the **what** of the farming operation, meaning finding answers to the question "What do we want to achieve?" Some goals and objectives that apply to citrus production were discussed in chapter 1. In summary, the citrus production manager is faced with a variety of challenges the most important of which are to:

- **Achieve per hectare yield targets** – This means that the production per hectare must achieve the targets that have been set in the annual budget. Annual targets for mature trees could vary from 30 to 60 tons/ha, and depend on the age of the orchard, the cultivar being produced, and other factors relating to the production site.
- **Ensure the end products meet market specifications** – The production manager must for example set production objectives to achieve the requirements of the markets in terms of size, colour and internal quality.
- **Ensure that the process is sustainable** - This means ensuring that the environment is not adversely or unnecessarily disturbed by the production processes, for example by pest control

chemicals, fertilisers etc., so that high levels of production can be sustained over the lifetime of the orchard.

- **Remain within the framework of Good Agricultural Practices (GAP)** – GAP calls for care in the use of chemicals to ensure safety for all operators, the use of pesticides, fungicides and fertilisers in a systematic, careful and planned way, and the judicious application of water to prevent wastage, contamination and erosion.

Secondary objectives may apply to individual farming operations, but meeting the objectives stated above will ensure the overall success of the operation.

3. **Planning**



Planning

Planning means to formulate a scheme, program or method to accomplish a specific goal, within a specific timeframe, and with a specific purpose in mind.

If goals are long-range, meaning that it will take more than a few years to achieve, or strategic, meaning that they apply to the farming operation as a whole, the planning involved in achieving these objectives will likewise be long-range and strategic in nature. If, on the other hand, goals are short-term, such as applying fertilisation before a certain date, a short-term operational plan or action plan is required.

Planning is concerned with thinking through, and when necessary listing, the steps and actions required to progress from the present situation to a desired situation.

We plan our every day activities automatically, such as getting up and dressed in the morning. However, when it comes to more complex actions or tasks we have to put more effort and care into planning. For example, fixing a roof leak requires as a first step, a plan. This plan will include how it will be fixed, what tools and materials are required, where these must be obtained, who will be responsible for overseeing the process and who will do the actual work, what sequence the process should follow, the costs involved, and by when it should be completed. Planning therefore concerns the **how, where** and **when** of any operation or task we may perform, before we perform it.

Without planning there would be no step-by-step sequence of actions taking us from where we are to where we want to go. Our actions would be random and we would waste time, energy and money in repeating certain steps and leaving out others, while compromising our chances of reaching our goal. In the process, we could do things that threaten the future of the business and harm the environment.

4. **Scheduling**



Scheduling

Scheduling is a management term that involves entering or drawing up a timetable for the completion of various stages of a complex project, or the co-ordination of multiple related actions or tasks into a single time sequence. Scheduling is most commonly used with regard to repetitive tasks, such as the application or irrigation water.

A schedule indicates the intervals between, or frequency of, actions. For example, a class timetable shows when different subject lessons will be held and the intervals between similar lessons. In the same way, a bus roster shows the regular arrival and departure times of buses. These are different kinds of schedules.

In citrus production, irrigation applications are scheduled, meaning that they take place at pre-determined times or frequencies. Similarly, spray applications are sometimes scheduled on a calendar basis, for example every two weeks or once a month.

Scheduling is important because it provides the manager and his staff with a fixed program for carrying out required actions or tasks. Once a schedule to an action has been set and communicated, the expectation is that it will be strictly kept to.

5. Organising



Organising

Organising means to arrange tasks into an orderly functional, structured, coherent and systematic manner to bring about harmonious or united action.

Proper organisation means that different resources for a specific task are available when and how they are required.

For example, consider the planting of a new citrus orchard. The production manager has to ensure that all the necessary resources for this operation are available in the condition and at the time they are needed. Part of the labour force would be allocated to preparing the orchard lay-out, while another would install the irrigation system, and a third group would be unloading the nursery trees from the truck. In all cases, the manager has to ensure that the labour force has the right equipment to carry out their tasks effectively. At the same time, the manager has to ensure that he has allocated his capital effectively between the different parts of the planting program.

Clearly, effective organisation has to be preceded by good planning.

6. Implementation



Implementation

Implementation is the act of carrying out the agreed plan according to an agreed schedule to achieve what has been agreed should be done.

As discussed above, a plan cannot be effectively implemented unless the necessary resources are available. It is equally important that the required infrastructure be in place. Infrastructure is a term that refers to permanent non-consumable items required to support the implementation process. This includes roads, rail and air links, equipment, tools, vehicles, fuel supply depots, vehicle maintenance facilities, chemical supply points, offices, storage rooms, pump houses, packhouses, etc. The production manager ensures that the necessary infrastructure is in place, and makes the appropriate contingency arrangements when such facilities are not yet available.

As circumstances and conditions change, the implementation process has to be constantly measured, evaluated, reviewed and adapted.

7. Coordination

Most tasks and almost all projects involve the activities of more than one person. Production management by definition is a process, the various aspects of which are carried out by different individuals with different skills.

We have already dealt with the concept of **organising**, which is about the allocation of resources. Coordination is about bringing in the various players at the appropriate times and in the most effective way in pursuit of the agreed objective. Most projects and tasks require some form of coordination. Without it, aspects of the work could be unnecessarily repeated and others lost.

According to *Mind Tools* ³ there are three basic coordinating mechanisms:

- **Mutual Adjustment** – This is a mechanism of coordination where nobody knows ahead of time exactly what they are going to do due to unpredictable circumstances. It is, for example, what two or more paddlers will do when they are rowing a boat through rapids.
- **Direct Supervision** – This method achieves coordination through one person taking responsibility for the work of others by issuing instructions and monitoring their actions.
- **Standardisation** – Here coordination is done in the planning stage, or on the drawing board. It involves groups working together to standardise the components of a product or service. It is through this kind of coordination that medical, law and business schools produce workers that do things in the same way.

Coordination is an important aspect of the citrus production manager's job. In fact, virtually all that gets done by the staff in the production process is the result of the coordination of different tasks or inputs. For example, the application of a pest control spray requires that the production manager coordinates with the administration personnel to ensure that the chemicals are ordered and delivered in time, the maintenance department to ensure that the tractors and spray equipment are in good working order, and the labour force to ensure that enough workers are available to complete the task.

8. Monitoring

It is not enough to plan, organise, and implement a program. The process can only operate successfully when the feedback cycle is also operating. The feedback cycle involves:

- Control
- Feedback
- Adaptation
- Correction

The feedback cycle is a continuous process of measuring progress and evaluating it against the original objective(s). It is about asking:

- "Are we still on track?"
- "Are my original assumptions still valid?"
- "Do I need to adjust my goals, timeframes or implementation process in some or other way?"

The feedback cycle must be formalised and must form part of the procedure for executing tasks. It may involve the use of short interval control measures. A short interval control measure is a progress check on a regular short interval basis, such as weekly or fortnightly.

One way of doing this is to break down the program into smaller short-term milestones and measure progress against these milestones on a scheduled basis. If any of the milestones is not met, a decision has to be taken on whether the implementation of the plan needs to be changed or whether the original plan needs to be adapted or corrected. The effectiveness of a pest control program can for example be

monitored by carrying out frequent and systematic orchard inspections of pest populations. Based on these results the programme can be adjusted to ensure that the original objective is met.

Figure 2.1 illustrates the management process chain, incorporating all the stages through to feedback and correction.

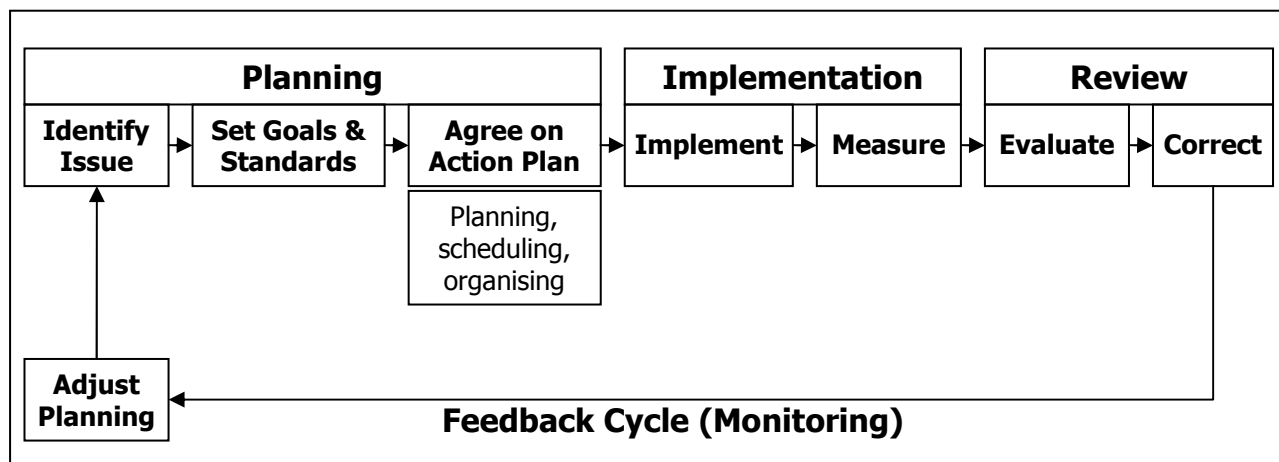


Figure 2.1: Management Process Chain

Chapter 2

- The basic managerial tasks are setting objectives planning, scheduling, organising, implementation, coordination, and monitoring
- Setting objectives is about finding answers to the question "What do we want to achieve?"
- Planning is about working out how to achieve an objective.
- Scheduling is about working out how a plan can be implemented.
- Organising is about arranging the various actions that has been planned and scheduled so that they can be performed within the required timeframe.
- Implementation is about carrying out the agreed plan according to the agreed schedule.
- Coordination is about bringing in the various players at the appropriate times and in the most effective way in pursuit of the agreed objective.
- Monitoring involves control, feedback, adaptation and correction.

Complete activity 3 in the **Learner Workbook**.

Chapter 3

After completing this chapter, the learner will be able to:

Understand and define the additional production management tasks

1. Introduction

Effective production management is firstly about understanding the basic management tasks described in the previous chapter, but it is also about understanding how to implement these tasks. In this chapter, we will look at the following additional management tasks:

- Decision-making
- Leadership
- Communication
- Motivation
- Delegation
- Discipline
- Human resource management

Being able to employ the basic management tasks depends on the production manager's ability to perform these additional tasks well.

2. Decision-Making

Decision-making is a regular feature of our every day lives, both at home and at work. We make many decisions without much effort, and without concerning ourselves unnecessarily with what their impact will be. For example, we make decisions about what to wear, when to perform a task, and many other small, seemingly insignificant issues. But even for the smallest decision there are consequences and risk. As the risk associated with a decision increases, so the decision becomes more important.

In citrus production, as in any other business, the level of decision-making is tied to the nature and level of the job. For example, the office cleaner has his tasks clearly and precisely described, and performs his tasks according to this description without making very many decisions on his own. At the other end of the scale, the production manager is faced with many different situations, some requiring decision-making that carries long-term and serious consequences for production, and thus for his company. The production manager has to use his discretion more often and with greater consequence than the cleaner.

Decision-making is the cognitive process of selecting a course of action from among multiple alternatives. Common examples include shopping, deciding what to eat, and deciding who or what to vote for in an election or referendum.

Decision-making is said to be a psychological construct. This means that although we can never "see" a decision, we can infer from observable behaviour that a decision has been made. Therefore we conclude that a psychological event that we call "decision-making" has occurred. It is a construction that imputes commitment to action. That is, based on observable actions, we assume that people have made a commitment to effect the action.

Decision-making is an important part of many professions, where specialists apply their expertise in a given area to making informed decisions. For example, medical decision-making often involves making a diagnosis and selecting an appropriate treatment.

Due to the large number of considerations involved in many decisions, decision support systems have been developed to assist decision makers in considering the implications of various courses of action. They can help reduce the risk of errors. These include:

- Program Evaluation and Review Technique (PERT)
- Critical path analysis
- Critical chain analysis
- **The Pareto Principle** – Also known as the 80:20 Principle, this is a simple technique that says that by completing only 20% of the tasks that you might have, you can in fact complete up to 80% of the total volume that your job or the task entails. It is however very important to make sure that you follow the correct methods and criteria to decide which 20% of the tasks at hand are the most important, and should thus be completed first.
- **Paired Comparison Analysis** – This technique helps a manager to work out the relative importance of a number of options. It involves using a grid to compare the merits of each option with each other option, one by one. In paired comparison analysis, also known as paired choice analysis, similar items are compared one against the next and the results are tallied to find an overall winner. A paired choice matrix or paired comparison matrix can be constructed to help with this type of analysis. This method should only be applied after in-depth study of the method.
- **Grid Analysis** – This technique is used for making a decision where many factors must be balanced. It is most effective where there are a number of good alternatives and many different factors to take into account.
- **Decision Trees** – This technique provides an effective structure to lay out options and investigate the possible outcomes of choosing these options. They help form a balanced picture of the risks and rewards associated with each course of action. In decision theory, a decision tree is a graph of decisions and their possible consequences, including resource costs and risks, used to create a plan to reach a goal.
- **Force Field Analysis** – This technique analyses all the forces for and against a decision. It is a specialised method for weighing up the pros and cons. Force field analysis provides a framework for looking at the factors, or forces, that influence any given situation. It looks at forces that are driving movement toward a goal, being helping forces, or blocking movement toward a goal, being hindering forces. Developed by Kurt Lewin, it is a significant contribution to the fields of organisational development and process management. It is a method for analysing change and is used in change management.
- **Cost / Benefit Analysis** – This technique assists the manager to make a decision from a financial point of view, and projects the costs and benefits related to the decision. Costs include people and machine resources for development, as well as running costs. Tangible benefits are derived by estimating the cost savings of both human and other resources. Intangible benefits, such as improved customer service and employee relations, may ultimately provide the largest payback, but are harder to quantify.

Decision-making is part of every facet of every business. Decisions are required when goals are set and when actions have to be taken to enable those goals to be met.

3. Leadership

As discussed earlier, management is concerned mainly with planning and budgeting, organising, implementing, controlling and problem solving. However, management is also about leadership. It could in fact be said that most good managers also need to possess strong leadership qualities.

Leadership requires a range of abilities and characteristics and there are many good leaders with very different personality types. However four key ingredients tend to be common in most successful leaders, being to:

- Give direction;
- Align people;
- Motivate and inspire people; and
- Introduce change

Good managers need to have leadership qualities in order to:

- Develop a vision of the future;
- Influence the creation of teams that understand the vision and goals;
- Energise people by understanding and satisfying their human needs; and
- Introduce new, more effective ways of doing things

Good leaders are usually emotionally mature, resilient, flexible and adaptable, persistent, results driven, energetic and decisive. They demonstrate the ability to take initiative, have a full grasp of the situations for which they are responsible, express their convictions and stimulate others to do the same, and encourage evaluation and feedback.

4. Communication

This is frequently identified as the most important factor underlying the ability of a group of people to work together productively. People gain perceptions of a task, an individual and an organisation through the things they hear, see and read. For the citrus production manager to improve performance, he must be sure that all of his people know:

- What to do;
- Why they are doing it;
- How to do it;
- How well to do it; and
- How well they are doing it.

Most people don't know these things. Good communication is vital if the objectives and goals are to be clearly understood and effectively met.

Many companies have formal communication policies that look at how information is shared on various levels of importance between individuals and between and within departments. These policies essentially cover what should be communicated, how, when, by whom and to whom. They also indicate what kind of information is confidential.

Many different techniques have been developed for improving verbal communication skills between individuals and groups of individuals. For example, one such method, Participlan[®], owned by Business Presentations Group (BPG), makes use of a visual mapping technique to get everyone in a group to participate, while maintaining the anonymity of participants.

BPG also markets an "Audience Route Map" which trains individuals on how to structure and present motivations, whether such motivations are at a high level involving the expenditure of large amounts of money, or at much lower levels between individuals.

At the heart of good verbal communication are three key issues:

- Good listening
- Appropriate body language
- Properly structured verbal or written content

Body language is important because it is said that 55% of our communication is through body language, 38% by tone of voice, and only 7% by words.

Good writing skills are also important for the production manager, as he or she is required to motivate and inform those above and below him or her with appropriate written memorandums, letters, instructions and reports. Many courses and references are on offer on improving writing skills.

5. Motivation

Motivation is about helping people to be passionate about their work. The basis for good motivation is participative goal setting, where every person is given the opportunity to participate in setting goals. As Tony Manning, a strategy consultant says:

- People get turned on when they're counted in
- When you treat them like eagles, they soar
- What you get hinges largely on what you expect
- Most people can and will take on far more than we think, if only they're given a chance

According to Farmers' Weekly contributor Peter Hughes, motivation killers include professional managers who do things by the book but don't care about their people.

Incentives can enhance motivation, though it must be remembered that internal motivation lasts longer than external motivation which must be repeatedly reinforced by praise and concrete rewards. A feeling of belonging (affiliation) and approval are strong motivators.

6. Delegation

Delegation is the practice whereby the manager entrusts his authority to others. The aim of delegation is to get the job done by someone else, not just the simple tasks, but also decision-making based on incoming information. With delegation, personnel have the authority to react to situations without referring back to their manager. However, the manager still remains accountable for the satisfactory completion of the task.

Delegation is a style of management that allows staff to use and develop their skills and knowledge to their full potential. To enable someone else to do the job, the manager must be sure that his personnel:

- Know what he wants
- Have the authority to do or achieve it
- Know how to do it

These all depend on a clear communication of the nature of the task, the extent of the discretion they can use, and the sources of information available to them.

Delegation does not mean that the manager should pass on his less pleasant tasks to his subordinates and keep the more pleasant tasks to himself. A good manager will distribute the mundane tasks as evenly as possible and the more exciting ones widely. Delegation also does not mean that the manager can hide behind his staff by giving full accountability to them for issues that he should be dealing with himself, which is referred to as abdication.

7. Discipline

Discipline is about doing what you are supposed to when you are supposed to and how you are supposed to do it. A production manager required to exercise discipline at all times. Discipline is what is required when a number of tasks have to be completed in a short period of time.

Discipline in the manner in which one approaches a task is essential, and this is based on disciplined thinking. If the objective have been set, the plan been agreed upon and all the other tasks been completed, it is the discipline of executing the task in the prescribed manner that will get the job done.

Disciplinary action is taken to deal with individuals who disobey company rules or whose performance is unsatisfactory in relation to agreed standards. Disciplinary action is an important part of the manager's

duties and positively reinforces the significance that the company and manager attach to the maintenance of standards and behaviour.

Some managers tend to avoid disciplining their subordinates for fear of becoming unpopular and losing their support. Other managers tend to use their disciplinary powers to enforce participation and performance. Neither of these extremes is good. Preferably the manager should strive to maintain consistency in dealing with disciplinary matters and be seen to be firm but fair.

Disciplinary action in companies has to be consistent with the requirements of labour legislation. In the event of a wrongdoing, set procedures have to be followed. These procedures are normally summarised by the company and communicated to all staff as a company directive. It is the duty of the manager to ensure that all of his personnel are aware of the rules and the process that will be followed in the event of wrongdoing.

8. Human Resource Management

The success or failure of a company or production department largely depends on the performance of its people. While it is the manager's direct responsibility to plan, organise, implement, coordinate and control, he requires support from his company to ensure that his most important resource, his people, are well cared for. This function, and various others, is the domain of the human resources department.

The key functions of human resource management are:

- Staff selection and recruitment;
- Succession planning and career path development;
- Staff training;
- Setting remuneration policy;
- Setting and monitoring performance management policy;
- Ethics and disciplinary procedures; and
- Industrial relations

In addition it is customary for human resources departments to manage the company's payroll and provide support for culture development activities, strategic planning, communications policy, pension policy and other company activities involving staff and their benefits.



Summary

Chapter 3

- Additional management tasks are decision-making, leadership, communication, motivation, delegation, discipline and human resource management.
- Decision-making is about weighing all the option and selecting the best course of action. There are various techniques to assist managers in this task.
- Leadership is about giving direction, aligning people, motivating and inspiring people, and introducing change.
- Good communication is about ensuring that everyone involved in a task or project knows what to do, why they are doing it, how to do it, how well to do it, and how well they are doing it.
- Motivation is about helping people to be passionate about their work.
- Delegation about entrusting authority for performing a task to a subordinate, while retaining responsibility for the outcome.
- Discipline is about doing what you are supposed to when you are supposed to and how you are supposed to do it.
- Disciplinary action is taken against an employee who does not do what is required of them.
- The functions of human resource management is staff selection and recruitment, succession planning and career path development, staff training, setting remuneration policy, setting and

monitoring performance management policy, ethics and disciplinary procedures, and industrial relations.



Complete activity 4 in the **Learner Workbook**.



Chapter 4

After completing this chapter, the learner will be able to:

Understand the process of setting goals and objectives related to systems within an agricultural business

1. Business Goal Setting

“Begin with the end in mind”. This is a well-known phrase, which expresses the importance of starting off any project with a picture of how things should look once the work has been successfully completed. For large scale and long-term undertakings, this picture is referred to as the vision. For smaller and shorter scale operations, this picture takes the form of specific outcomes and is commonly referred to as objectives or goals. The vision or goal is therefore the “what” of any project. It can simply be defined as “the end one strives to attain”. As mentioned in a previous section, **planning** focuses on the steps that have to be taken to achieve the goal, i.e. the “how”. There are many types of goals, for example:

- **Long-range** goals are for the company as a whole.
- **Shorter-term** goals are for divisions, departments or other groupings within the company.
- **Business** goals include marketing, technical, production, management and financial goals.
- **Outcome** goals specify and quantify the required results.
- **Performance** goals set requirements relating to the performance, skills or knowledge to be acquired by groups or individuals.
- **Activity** goals list the activities that are to be measured, for example number of meetings to be attended, etc.
- **Personal** goals cover the aspirations of individuals.

The most critical issue relating to goals and goal setting within an organisation is that the goals set at various levels for various purposes and functions must all be aligned towards meeting the overall goal, or vision, of the organisation. For citrus production, this means that the goals of the production department must align with those of the company as a whole, and the goals of individual projects or activities within the department must align with the production department’s goals. This concept is illustrated in figure 4.1 below.

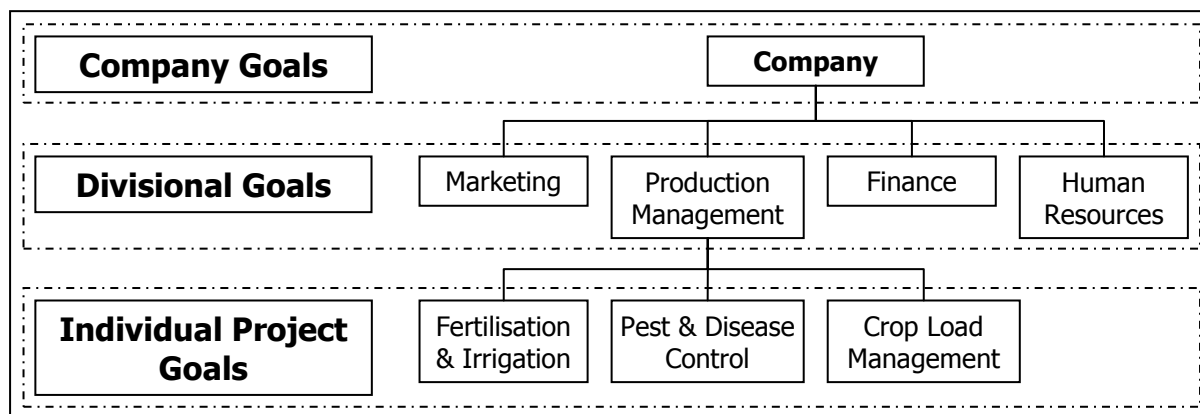


Figure 4.1: Relational Goal Setting

2. Goal Setting Mechanisms

Goal setting is a process to answer the question: "Where do I want to be in relation to where I am now?" Answering this question requires a participative process to get the buy-in of all stakeholders. There are various ways in which this can be achieved.

In most cases, the company's overall goal, or vision, is set by senior management and the board of directors. Thereafter, the vision and objectives are cascaded down to the various levels in the company through a participative process led by divisional and department heads. As mentioned above, the goals set at each level have to be aligned with the vision and objectives of the company as a whole.

The sessions at which individuals contribute to the setting of their department's goals will use various tools and techniques to ensure good order and full participation.

Such techniques could involve the recording of verbal responses to questions such as: "What are the strengths, weaknesses, opportunities and threats relating to the business?". This mechanism is referred to as a SWOT analysis.

All such methods require some form of environmental analysis or scan. This can be done in various ways but boils down to answering the question: "What are the likely scenarios that our production unit is likely to face in the next 24 months?". The answer to this question requires consideration to be given to the various political, economic, social, technical, legal, and environmental issues which could impact on the production unit. Goals cannot be set unless:

- The present situation is known;
- The effect that various internal and external factors which could impact on the business are known and evaluated; and
- The purpose and objectives of the business are clear

There are various ways in which the above can be achieved. These include:

- Conducting a SWOT analysis in which the present strengths, weaknesses, opportunities and threats are considered and evaluated
- Conducting an environmental scan where all political, environmental, social, technical, economical, and legal issues that could possibly impact on the business are considered
- Considering what the company would be saying and doing if it was operating in the perfect way
- The setting of clear company objectives at the highest level

Goals are set by people, not by processes or techniques. It is therefore important that when goals are being set, whether it is at divisional, departmental and individual level, there is an alignment between the aspirations and goals of the individuals involved in the goal setting and implementation process, and that of the company. For example, it is senseless for a manager to set goals which may require taking technical shortcuts when his personnel are committed to carrying out diligent and thorough work.

In order for it to be successful, goal setting requires open communication, motivation and the complete buy-in and understanding of the bigger company objectives by those tasked with the job of setting lower order goals.

3. Goals Typically Relating To Citrus Production Systems

The total citrus production process can be seen as the sum of a number of smaller production systems working together to achieve the desired result. The production process will have three or four primary or overall goals. The sub-systems will have their own goals, which are aligned with the overall goals.

If one of the overall production goals were to increase average per hectare yields across all orchards to 30 tons, there would have to be a number of lower level goals set to enable this to happen. Such lower level goals could, for example, be to:

- Apply all nitrogen fertiliser applications by 30th July;
- Girdle all trees older than 6 years by 25th August;
- Apply first pest control sprays by 15th September and follow-up sprays six weeks later;
- Increase the frequency of irrigation applications from 1st October.

The end result would reflect the extent to which these lower-level goals had been met.

4. Setting and Discussing Theoretical Goals for a Variety of Citrus Production Systems

The goal setting process involving different functions or departments should not happen for each of these functions in isolation. It is important for the individual heading up each function to be aware what the goals are of the other functions.

For each goal there needs to be an action plan. The action plan lists what has to be done, by whom and by when. Since common resources are required to meet these goals, it is important that there is an integrated approach to goal setting involving those leaders of the different functions.



Components of a Planting Plan for 20 ha of Grapefruit

This process comprises a number of steps. Firstly, the market potential must be assessed. Thereafter, the production potential for the intended venture must be considered. Then a SWOT analysis is needed to determine whether the organisation is in the positioned to undertake such a venture, meaning that the risks involved must be assessed. Finally, assuming the SWOT analysis has a positive result, the production goals and production plan are put in place.

1. Marketing Potential

Evaluating the marketing potential involves an assessment of the following:

- World grapefruit production
- World grapefruit exports
- RSA grapefruit production
- RSA grapefruit exports
- RSA's competitive position
- Factors affecting the demand for RSA grapefruit
- Export and local markets availability

2. Production Potential

Evaluating the production potential involves an assessment of the following:

- Climate
- Soils
- Water and Irrigation
- Existing plantings
- Cultivar selections for new plantings
- Estate infrastructure
- Agro chemicals and consumables

3. SWOT Analysis

After the above assessments have been completed, it is important that an assessment be made of the potential success of the intended venture. A SWOT analysis is a handy tool for identifying the present status and future potential of the operation. This is done through discussion with managers and staff in a co-ordinated session. An example is given below:

<u>Strengths</u> • Grapefruit quality • Early maturity • Secure and plentiful water • Excellent soils • Good range of high quality rootstocks • Committed ownership • Good citrus production technical skills • Good PR skills – well connected • Labour plentiful • Close to port • Innovative management • Low per unit labour costs • Labour literacy high (100%) • Good market potential	<u>Weaknesses</u> • Labour skills poor • Imports of inputs difficult and costly • No GlobalGAP (environmental) compliance • No local factory outlet • Poor quality and unreliable machinery • Packhouse in bad condition • No regular management accounts • No market access to key markets ◦ Japan ◦ USA • High pest pressure ◦ Thrips ◦ Fruit fly ◦ False codling moth (FCM) • Low export percentage • Lack of available logistics to exploit early maturity of grapefruit
<u>Opportunities</u> • Expand red grapefruit production into market gaps left by other farmers who have removed trees • Reduce electricity costs • Obtain GlobalGAP (environmental) accreditation • Improve labour skills by training • Upgrade equipment reliability • Improve systems ◦ Production and packing records ◦ Human resource ◦ Finance and reporting ◦ Marketing • Explore market niche opportunities • Investigate lime production • Investigate local processing • Gain access to Japan • Improve nutritional management • Improve pest control	<u>Threats</u> • Water availability ◦ Floods – medium risk ◦ Drought – low risk • Phytosanitary pests and diseases ◦ Black spot ◦ Fruit fly ◦ FCM • Management succession • Labour unrest • Political unrest • Security • Low market prices • Environmental requirements • Lack of management depth

4. Production Goals

The production goals would include:

- Establishment of phased planting of 5ha per annum over the next four years, with the first planting commencing in September 2006. Note that as discussed elsewhere, there would be many sub-goals attached to this primary, long-term goal.

- Installation of accredited environmental system by January 2007.
- Initial production objective of 10 tons of exportable fruit in the first year of production (2010).
- Costs of establishing the orchards and annual operational costs will be covered for each block of trees planted in the 7th year after planting.
- When in full production (2017), the annual yield will be 400 tons of export fruit/annum going forward, giving some 30,000 cartons of export fruit at a net profit of R150,000 per annum.

5. Production Plan

The production plan consists of a list of actions required to achieve the above objectives, each with a target date and interim milestones so that progress can be reviewed on a regular basis.



Chapter 4

- The different types of goals are long-range goals, shorter-term goals, business goals, outcome goals, performance goals, activity and personal goals.
- Goals set at various levels for various purposes must all be aligned towards meeting the overall goal, or vision, of the organisation.
- There are various mechanisms to assist with goal-setting, one of the most useful being a SWOT analysis, which analysis the strengths, weaknesses, opportunities and threats to the organisation.
- Goals in a citrus production environment can be overall goals, such as production targets, or specific goals relating to specific production practices.

Bibliography

Publications:

The Trade Chain of the South African Fresh Fruit Export Industry, 2004, Production Book 1 of 9, page 31, published by the Fresh Produce Exporters Forum (www.fpef.co.za)

One Hundred Ideas for Managers, 2004, Tony Manning, Consultant in Competitive Strategy and Change Management, P.O. Box 750, Morningside 2057, South Africa

The Art of Delegation, Gerard M. Blair, www.see.ed.ac.uk

Websites:

Mind Tools: www.mindtools.com

Business Management Goal Setting: www.mikeholt.com

