

# Citrus farming: off-season tasks

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## Citrus farming: off-season tasks

'Off-season' is a misnomer, says Marble Hall citrus farmer Piet Engelbrecht. This is when crucial tasks such as pruning take place. Gerhard Uys visited him.



Trees should be spaced adequately to prevent their growing into each other and competing for space and light.

Photo: *Gerhard Uys*

*By Gerhard Uys*

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Piet Engelbrecht, who grows citrus on 450ha in the Loskop Valley near Marble Hall, Limpopo, says that the management of a citrus orchard in the off-season determines the success of a harvest.

"The moment the last fruit is picked, the next season begins," he stresses.

Almost 70% of input costs are incurred during this period, according to Piet. This results in a considerable risk, as there is not much money left over to counter problems such as drought, hail or pests that might occur later on.

Labour costs at this time are a major part of the expenses. "These become sky high the moment we begin pruning, fertilising and irrigating."

For optimal production, several important factors have to be considered. Managing the health of the irrigated area

beneath a tree, for example, is crucial. Mulches, usually wheat straw, are packed under young trees to slow evaporation and lower soil temperatures by 5°C.

This helps root development and keeps the surface of the soil cool, ensuring that the roots do not have to grow too deep to escape the heat. In addition, the mulch decomposes slightly, contributing to humus, letting air into the soil and helping to regulate temperature further.



*Piet Engelbrecht of the Piet Engelbrecht Trust.*

### **The importance of pruning**

To ensure a good harvest, the tree canopy must be pruned to allow light and air to penetrate it at all levels. If this does not happen, the tree becomes too large and the fruit grows on the outside branches only.

“We’ve been doing more and more pruning over the past couple of years and the results have been good,” says Piet. “Pruning renews a tree. Years ago, no one pruned, or pruned only lightly, and this proved to be a mistake.”

A useful test is to have someone stand on the other side of the tree after pruning. If the person can be identified clearly, the tree has been pruned optimally, he explains.

Trees should also be spaced adequately to prevent competition for light. Piet plants with an inter-row spacing of 6m and an intra-row spacing of 3m.

The pruning begins immediately after picking is complete. Each variety is pruned slightly differently, but the basic principle is the same: shorter, stubbier trees, with a bush-like appearance.

### **Method**

The key is therefore to avoid long shoots, as these cause large parts of a tree to be vegetative rather than fruit-bearing. For effective pruning, each shoot should be gripped just above the growth from the previous season’s pruning and cut at that point.



This forces a branch or shoot to split again and produce new growth. The distance between the bifurcation (the split in the branches) is kept narrower, reducing the height of the tree, but resulting in a larger production area.

Another advantage of shorter trees is that less use has to be made of ladders.

“With soft citrus you want shorter internodes and no crossed branches,” explains Piet. “Soft citrus is also pruned more than navel oranges, for example. Lemons are heavily pruned because they’re aggressive growers and need to be kept under control. By contrast, Valencia oranges take 12 months before a new branch initiates blooming. Valencias also carry on the previous year’s axillary buds and require less pruning.”

## **Fertigation**

Irrigation and fertigation are both controlled by computer. Fertigation begins in July, ideally after all the fruit has been harvested. Fruit still on the tree may remain green if fertiliser is applied before it ripens. Fertigation is continued for approximately six months, and Piet tries to complete the process in the first 21 days of each month.

A leaf analysis of a representative area of about 1ha to 3ha is conducted annually.

Currently, 80% of Piet’s orchards are under drip irrigation (3ha to 5ha blocks). The rest is under micro-irrigation (2ha to 3ha blocks). Piet plans, however, to convert to drip irrigation only.

Open hydroponic systems (OHS) control the drip irrigation and in peak times irrigate eight to 12 times a day for an hour at a time.

“Your most important tool for measuring soil moisture is a spade,” says Piet. “Only through experience do you learn what the best soil conditions look like, but a good rule of thumb is damp soil from which you can make a clod. It must not be runny.”

After soil samples have been analysed by Bemlabs, the OHS spreads the correct fertiliser levels through the irrigation systems.

Although irrigation continues unabated, fertigation is halted on Sundays as there are fewer managers available to spot an error. This also has the advantage that when the irrigation system is flushed on Monday no fertiliser will be lost due to a mistake the previous day.

“You can recover from an irrigation mistake, but a fertiliser mistake is harder to correct,” explains Piet.

Initially, only NPK was administered. Today, calcium, magnesium and micro- and macro-elements are all administered based on the results of the soil analysis.

Because certain elements are taken up more efficiently at different pH levels, Piet and his team adjust the latter throughout the fertilising period.

“We start with a normal water pH of between 7,5 and 8,5, but attempt to keep it at 5,5 to 6,5,” he explains. “We regulate acidity with hydrochloric acid, and take the pH level as low as 4,5 to get uptake of all elements. It’s all controlled by computers.”

Agritreat (sulphuric acid) is used to flush lines and loosen the magnesium that forms on top of algae. After this, hydrogen peroxide is put through the system to loosen the algae. All pipes are flushed with water once a week to clear accumulated dirt.

Additional carbon is used to help build up soil humus. But carbon can feed both beneficial and detrimental microbes and the soil condition is important in keeping the former healthy and controlling the latter.

“Microbes detrimental to plants prefer low oxygen levels and too much water, and attack root systems when they

feed. Keeping an eye on the irrigation system and managing leaks is therefore critical,” says Piet.

Beneficial microbes assist in breaking down nematodes and Phytophthora or plant-damaging moulds. Piet buys in microbes as standard practice and applies some directly onto the soil and others through irrigation.

Beneficial predators that target pests are also purchased and spread in the orchards. These include:

- Predatory beetles of the *Cryptolaemus* genus that feed on mealybugs.
- *Cryptophlebia leucotreta* granulovirus (CLGV), which attacks the false codling moth. This lives in the digestive tract and causes a reduction in appetite and eventual death.
- Sterile white codling moths, which help reduce false codling moth numbers.
- Wasps, which are distributed through the orchards in matchboxes.

Most beneficial predators die during winter due to the cold and to pest control measures that also affect them, and have to be restocked in warmer months.

### **Modern digital technology**

New technologies are playing an increasing role in orchard management. Satellite photographs are used to provide an accurate view of leaf conditions on a biweekly basis. This is sent to a computer and a report is generated, enabling Piet to make management decisions for a specific area.

Soil probes send a moisture update every half-hour and the irrigation needs of each orchard are adjusted via computer.

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farmer's weekly

