

During May and June CRI presented its annual production, IPM and disease management workshops nationwide. By Coenraad Fraenkel



Six production regions (Letsitele, Groblersdal, Nelspruit, KwaZulu-Natal, Eastern and Western Cape) saw delegates attend the latest round of production, IPM and disease management workshops.

This year the traditional stand-alone workshops (IPM-DM and production) were combined and took on a new format, incorporating the economics of citrus production. A key focus for the Southern African citrus industry is the implementation of a dedicated integrated pest and disease management strategy, a topic well covered during the workshops.

The golden thread throughout the various talks presented by the researchers and extension personnel of CRI was the current challenging environment in which the industry finds itself, and sustainable solutions to adopt for long-term profitability.

"Stop bragging about your tonnage and start focusing on the profitability of each orchard," cautioned one speaker discussing the benefits of pruning and crop manipulation. Financials from several case studies proved that lower yield per hectare could be significantly more profitable than high yields. The main drivers for profit are the desired fruit size, the price negotiated for the fruit, and a high pack-out percentage. Unlike what was historically believed, high yield per hectare doesn't necessarily translate into profitability.

The workshops were well attended, and the overall feedback was overwhelmingly positive.

Highlights from the workshops

Citriculture/production

Crop manipulation

- Crop manipulation strategies should include and complement the irrigation, pruning, and nutritional strategies adopted for an orchard.
- The crop manipulation strategy should be seen as a toolbox of tools that can be used to derive a specific outcome.
- This may include
 - o fruit set improvement
 - o chemical thinning
 - o hand thinning
 - o girdling
 - o navel end management
 - o growth inhibition
 - o rind condition management.

Nutrition

- A sound nutritional strategy is compiled using historic trends, collecting data in the orchard during the season, and adjusting the programme accordingly.
- The nutritional programme is as good as the implementation thereof, the goal being selecting the best product formulation to complement the programme.
- The nutritional strategy should not stand in isolation and needs to support the crop manipulation strategy.

Pruning

- Pruning is an excellent tool to
 - o set up the correct tree structure
 - o reduce height
 - o open light and spray channels
 - o improve pest and disease control
 - o improve fruit size
 - o improve rind colour and integrity



Workshop delegates absorbing content



Topical at the workshops, was current industry challenges, and sustainable solutions for long-term profitability.

- o improve internal quality
- o save water
- o save costs.
- Most importantly, it improves income and profitability p/ha.

Good harvesting practices

- Good harvesting practices are extremely important to ensure that fruit reaches the packhouse in a sound condition, with the best chance of being packed and shipped seamlessly for optimal shelf-life of the fruit. The following aspects were discussed:
 - o handling of harvested fruit
 - o when to harvest
 - o harvesting process
 - o picking injuries
 - o long stems
 - o drenching
 - o degreening
 - o transport of harvested fruit.

Integrated pest management

- Dr Sean Moore sketched the road to IPM and emphasised its importance for cost-saving and sustainability, as well as compliance with ever-increasing

market requirements.

- It was emphasised that a successful IPM strategy is built on the three pillars of biological and cultural control, with chemical control as a last resort.
- Dr Tim Grout conveyed the factors affecting the efficacy of spray applications. The outcomes are:
 - o It is possible to reduce volumes for full-cover sprays if we prune trees, drive slower, use hollow-cone nozzles, and have a high volume of oscillating wind.
 - o Film cover for inside fruit to control CBS and FCM, will not be achieved much below 6 000 l/ha with current spray machines.
 - o Volumes for mealybug control on the tree trunk will need to be higher to penetrate cracks in the bark and the wax covering of the pest.
 - o Remember to calibrate spray machines regularly and replace nozzle discs frequently, especially if spraying copper.

- The IPM team also provided guidance on the management of the most important phytosanitary pests (FCM and fruit fly) and other important pests.

Summary from the presentations

False codling moth (FCM)

- Shipping regimes for FCM within the FMS are not standalone cold disinfestation treatments (apart from the SC1 code, they only specify the set temperature, not the pulp temperature).
- Do not rely on the shipping regimes to rectify shortcomings in orchard or packhouse management.
- Cold shipping is just another component in the multi-tiered systems approach.
- Do not slack with orchard management. Even though oranges only ship under option C codes, they must still be subjected to the same pre-harvest management requirements as other citrus.

Fruit fly

- Fruit fly control should be timely.
- All the registered products are effective when used at the recommended dose.
- Area-wide and coordinated control is the best way to combat the occurrence of fruit fly.
- Keep trap catches below the threshold, to mitigate the risk of fruit infestation.

Thrips

- Apply a pre-blossom treatment to reduce thrips on spring flush: e.g., methamidophos stem treatment or full-cover organophos-

phate (OP) spray for mealybug.

- After petal fall, base sprays on scouting.
- Use copper oxychloride rather than mancozeb for the first black spot contact fungicide spray, to preserve predatory mites.
- If you must use a long-residual thripicide, spray it within three weeks after petal fall, and only as an outside (light) cover spray.
- If you spray an OP at 90% petal fall and follow with formetanate/chlorfenapyr bait, the bait must not be applied later than four weeks after petal fall.

Mealybug

- Under a good IPM strategy, it should not be necessary to spray for mealybug.
- Use inspections and scouting to determine if it is necessary to spray, and whether one or two sprays are required.
- Preventative control is more effective than corrective control.
- Use high-volume, full cover sprays.
- Mealybug can only be kept under control if the natural enemies are protected.
- Ant control should be focused on the tree, as ants are effective predators of pest pupae on the ground.
- Parasitoid augmentation will only be effective if done early and in a natural, enemy-friendly environment.
- Only spray correctively if mealybug numbers did not decline after peaking in Dec/Jan/Feb.

Red scale

- Control red scale preventively.
- Maintenance options: Movento plus oil, or mineral oil alone in winter and/or summer.
- Take note of increasing occurrences of imidacloprid resistance.
- Medium-grade mineral oil 1 – 1.25% (winter and/or summer) is effective and safe for the tree.
- Monitor red scale infestation, especially to enable a softer approach.
- Be aware of the negative effect of products on parasitoids.
- Only use methomyl correctively for red scale.

Region-specific pests

- Presentation content also included useful information on the management of specific regional pests like carob moth, woolly whitefly, ants, citrus looper, fruit-sucking moth, lemon borer moth, coffee bean weevil, stink bugs, leafhoppers, and citrus psylla.

Disease management

- These are highlights from the disease management team's guidance on the management of citrus black spot (CBS), *Alternaria*, *Botrytis*, and root health.

CBS

- Chemical control of CBS is very effective, but only if spray programmes are diligently followed and spray machines are well calibrated.
- All fungicides used, must be registered for CBS control under Act 36 of 1947.
- Be cautious of applying more than two consecutive sprays of strobilurin products per season, especially when targeting *Alternaria* Brown Spot (ABS) and CBS.
- *Alternaria alternata* has a high risk of strobilurin resistance development.
- Keep accurate spray records (dates, products, and labels).
- It is essential to strictly adhere to the CBS control measures in orchards prepared for the EU.

Alternaria

- Phylogenetically distinct lineages of the fungus *Alternaria alternata* cause ABS and *Alternaria* Core Rot (ACR).
- It is critically important that a preventative approach be followed in the management of *Alternaria* diseases in the orchard.
- Non-chemical control options must focus on inoculum reduction, such as proper pruning, and removal of pruning debris and infected fruit or foliage.
- Chemical management of ABS can be integrated with fruit protection programmes for CBS. However, chemical programmes

aimed at ABS control should commence at the emergence of the first spring flush and should continue until harvest. Currently, registered control options include the use of contact fungicides (copper, mancozeb) and systemic fungicides (strobilurins). Tebuconazole, difenoconazole and 2,4-D are registered for the control of ACR. It is very important to follow label recommendations when applying fungicides.

Botrytis

- One *Trichoderma asperellum* product is registered for suppression of *Botrytis cinerea* on citrus in SA.
- Pyrimethanil can be used in a preventative programme.
- Fungicides applied during full flowering and fruit set for ABS control could also have an effect on *Botrytis* infection of flowers.

Root health

- Proper soil preparation and management are critical.
- Start the management of root health early in the life of the tree.
- Monitor from the establishment of the orchard and continue regularly.
- Early intervention is most effective.
- A healthy root system = a sustainable and profitable orchard. 🍊

For more information on the CRI workshops or other relevant events, please visit the CRI website: www.citrusres.com (scroll to the Events tab) or contact your CRI Area Extension Manager.

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