

Field Spraying of Mangoes To meet ICA-19

Mango growers in the Exotic Fruit Fly Quarantine Area are required to be accredited with Interstate Certification Assurance (ICA-19) this mango season. ICA-19 recognises that a systems approach of *field spraying or bait spraying, fruit inspection* and *post-harvest treatment* is the most effective method to eliminate the risk of fruit fly infested fruit from moving into interstate markets. Each procedure plays a vital role in reducing this risk. The following protocol addresses only field spraying

The protocol requires that a minimum of three fruit fly sprays be applied in the six weeks prior to the beginning of harvest. To be an effective control of fruit fly, spraying needs to achieve thorough coverage of the canopy

This Agnote recommends the spray application equipment and spraying rates necessary to provide an effective spraying program. These recommendations are a guide only, as mango orchards may differ greatly. Refer to Agnote I46 "Approved Exotic Fruit Fly Treatment Methods" for recommended chemicals for fruit fly.

HAZARDS TO SPRAYING

The major hazards to an effective spraying system are equipment type, volume applied, tractor speed, worn and blocked nozzles and rain.

EQUIPMENT TYPE

For trees to receive adequate spray coverage it is recommended that the top half of the tree receives two thirds of the total spray. To accomplish this, spray equipment needs to be compatible with the size of the trees being sprayed. Minimum recommended spray equipment for various tree heights are as follows:

Table 1. Spray equipment

<i>Tree Height</i>	<i>Spray Equipment</i>
To 2 m	Vertical boom.
2-4 m	Air blast sprayer or tower mounted boom.
4-5 m	One sided air blast sprayer.
Above 5 m	Air blast sprayer with tower.

A hand held sprayer with a lance may be considered suitable for use on young trees up to 2 metres in height in orchards with a small number of trees.

VOLUME APPLIED

Variability in pruning practices on mango orchards means it is difficult to issue hard and fast rules recommending spray rate per tree to achieve thorough coverage throughout the canopy.

Proper calibration can only be achieved through a detailed use of visual assessment, water sensitive paper and fluorescent dyes.

As a guide to volume of spray to apply to each tree, the following table may be used:-

Table 2. Spray application volumes

<i>Tree Diameter</i>	<i>Normal Canopy</i>	<i>Thick Canopy</i>
1-2 m	1-2 L/tree	2 L/tree
2-4 m	2-3 L/tree	3-4 L/tree
4-6 m	3-5 L/tree	4-7 L/tree
>6 m	7 L/tree	10 L/tree

This figure represents the actual volume applied to each tree, not the average volume applied to the orchard.

CALCULATING ACTUAL VOLUME APPLIED

It is possible to calculate the actual volume that has been applied to each tree by using the following method.

You will need to know:

- Spray output (measured volume of all nozzles, in litres/minute);
- Tractor speed (actual speed, in metres/minute);
- Tree diameter (metres).

Measuring volume per tree:

Sprayer output (L/min) is multiplied by tree diameter (m), then divided by tractor speed (m/min), and all is multiplied by 2 (because both sides of the tree are sprayed).

Example:

Spray output - 25 litres/minute
 Tree diameter - 4 metres
 Tractor speed - 40 metres/minute

$$\frac{\text{Spray output (25) x tree diameter (4)} \times 2}{\text{Tractor speed (40)}} = 5 \text{ litres/tree}$$

Your Figures

Spray output - _____ L/min
 Tree diameter - _____ m
 Tractor speed - _____ m/min
 = _____ litres/tree

This figure can be compared with the guide-lines in Table 2.

It is recommended that actual tractor speed in metres per minute be determined by averaging several timed runs. Approximate figures converting km/hr to m/min are listed below:

Table 3. Speed conversion chart

Speed (km/hr)	Speed (m/min)
2	33
2.5	42
3	50
3.5	59
4	66
4.5	75
5	83

TRACTOR SPEED

For efficient spraying tractor speed should not exceed 5 km/hr (83 m/min). Speed faster than 5 km/hr will reduce the capacity for spray to be accurately delivered to the tree canopy.

WORN NOZZLES

Worn nozzles reduce the adequacy of spraying by adversely affecting droplet size and sprayer output. Your nozzle output needs to be checked against published nozzle specifications. If the nozzle output varies by greater than 10% compared to the specification, then the nozzle should be discarded.

Remember that wettable powders, such as 'mancozeb', accelerate nozzle wear considerably and often nozzles will need replacing before and during each season.

BLOCKED NOZZLES

Check during spraying for blocked nozzles which reduce the efficiency of spray application. Spray line filters should be installed and cleaned regularly to decrease the chance of nozzles becoming blocked.

RAIN

Rain within 2 hours after spraying decreases the ability of the chemicals to work on the plant. If rain occurs within 2 hours of spraying, the spray must be repeated.

USEFUL INFORMATION

Information on sprayer calibration is in Agnote D36 "Preparation and Setting Up Airblast Sprayers".

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