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Best Planting Practise to ensure Maximum Survival

STOCK PRODUCTION AT RIVERDENE Quality plantstock is not produced by accident and they do not 'just happen', they are produced by design and careful planning. If any stock is to establish quickly when planted out, it must be in full energy state and exhibit a readiness to grow and it must not exhibit any mineral deficiency or be in a stressed condition & in the case of specialty stock such as Longstem tubestock, the aim is to produce a plant that is not only tall but has a thick and rigid trunk that will not rot when deeply planted. Each species has a different time scale to reach this stage, so each species is considered on its own merits.

All our tubestock are grown in suspension trays which are then placed on pallets so that the roots are not in contact with any soil and are therefore air-pruned. Once tubestock is established, it is hardened off to full sun conditions and grown on in full sun until despatch, unless the species, such as some rainforest species and ferns, require shaded conditions to grow correctly. Potted stock is also grown in full sun conditions unless its nature requires shade or shelter. **All Riverdene plantstock** is grown in a potting mix that is composted over a period of 6-8 weeks and the temperatures reached during this process are high enough to destroy any undesirable pathogens.

STORING YOUR PLANTS - Your plants have been grown in **FULL SUN** under NURSERY CONDITIONS and are ready to plant immediately. If you are unable to plant your consignment immediately, please observe the following

- DO NOT store your plantstock in shade (unless they are shade species). This will soften the plants & may cause problems on planting out. Make sure the plantstock receives full sun for at least half a day.
- If your consignment cannot be planted immediately, the plantstock will need to be watered on a regular basis. (Minimum of once daily & up to twice daily on very hot or windy days) Make sure the root ball is thoroughly soaked and do not be misled by light rain, it rarely soaks the root ball. These remarks are particularly pertinent to Longstem tubestock or large potted stock.
- Do not store plantstock where animals of any kind can damage them. (Even cats and dogs can cause damage by laying or jumping on them)
- Do not try and minimise watering by storing your plantstock in permanent water retention well or vessel. This will cause root rot very quickly. If tubestock has dried out, it is acceptable to soak for a short time until the root ball is thoroughly soaked and then remove them immediately.

OPTIMUM PLANTING TIMES - Planting times are to a certain extent influenced by site conditions. Domestic plantings that can be tended and watered daily can be undertaken at any time of the year. Revegetation works that cannot be regularly tended either for accessibility reasons or project size, should be undertaken in Autumn as a first preference for frost hardy species or in Spring for frost sensitive stock. If there are any on ground remediation works associated with your project then it is advisable to plant as quickly as possible when these are completed, but there are certain pitfalls to avoid as follows:-

1. Do not plant in extreme weather conditions (Excessive & prolonged high temperatures or winds)
2. Aquatics should be planted from October to January (this is their optimum growing time)
    a. Aquatics are a possible exception to Point 1 above.
    b. If aquatics are planted in areas where water activities may cause wave action, provision must be made to secure the plants in place or reduce wave impact with booms or similar.
3. Optimum planting times for shrubs and trees is Autumn and early Spring. Avoid early summer **unless plants can be watered regularly**.
4. If weather conditions are favourable, planting of frost hardy stocks can be undertaken in Winter in sheltered areas. Protection sleeves are useful in preventing frost & small vermin damage to your seedlings.

SOIL CONDITIONS - You should ensure that there is enough depth of topsoil for the establishment of plants especially if the majority of planting will be undertaken in disturbed or eroded areas. When planting your stock, make sure the rootball is thoroughly soaked before planting AND well watered immediately after planting. The latter is best done before the planting hole is fully back filled. REMEMBER – the only water that does any good is water that reaches the rootball. Water running on the surrounding soil has no effect on the plant itself. ***We cannot emphasise enough the***

importance of doing this process correctly and don't forget all plants MUST be watered in on the day of planting! General guidelines for various soil types are as follows.

IDEAL SOIL CONDITIONS – DOMESTIC & RIPARIAN PROJECTS-Satisfactory soil conditions would include a minimum depth of topsoil of100mm. Ideal soil conditions would include topsoil to a depth of at least 150mm. Very few sites would be considered ideal without some modification. If sufficient topsoil is not present, a quality soil amendment will improve the survival rate of your plants significantly. Any soil amendment should be –

- Weed and pathogen free
- Have a PH of 6 to 6.5 (slightly acidic).
- As far as possible, the soil amendment should also be blended to match the existing soil profile. (ie combined with a portion of the existing topsoil)
- Be certified to be free of or at least have a level of Phosphorus that does not interfere with the growth of Australian natives.

Planting in satisfactory soil conditions - Planting into satisfactory or ideal soil conditions requires very little attention to detail. General guidelines are as follows.

- Holes for planting should be three to four times wider than the diameter of the root-ball, but should be no deeper than the root-ball of the plantstock
- Plants should be watered thoroughly and show good turgidity prior to planting.
- Top of the root-ball of the plantstock should be level with the surrounding soil (unless planting longstems)
- Once planted the stock should be "watered in". The planting hole and root-ball should be saturated.
- If the planting soil is of a reasonable quality, there should be no need for additional fertiliser.

ADEQUATE SOIL CONDITIONS – LANDSCAPE OR REVEGETATION PROJECTS-The ideal planting conditions for any size plants is to have a reasonably friable soil for planting. Comprehensive & medium to large scale projects where planting is to be done into the natural soil will benefit from some simple modifications such as deep ripping. Deep ripping ensures good planting conditions, faster establishment and faster growth; however this does not apply to planting on a riverbank or gully area. Deep ripping near watercourses can cause severe erosion during a flood event. It is recommended that the planting lines should be deep ripped as early as possible before planting. Preparation can be done up to 12 months in advance so there is enough time for any large clods to break down gradually, however if this is not possible all large clods should be broken to a coarse tilth before planting

Procedures for correct deep ripping

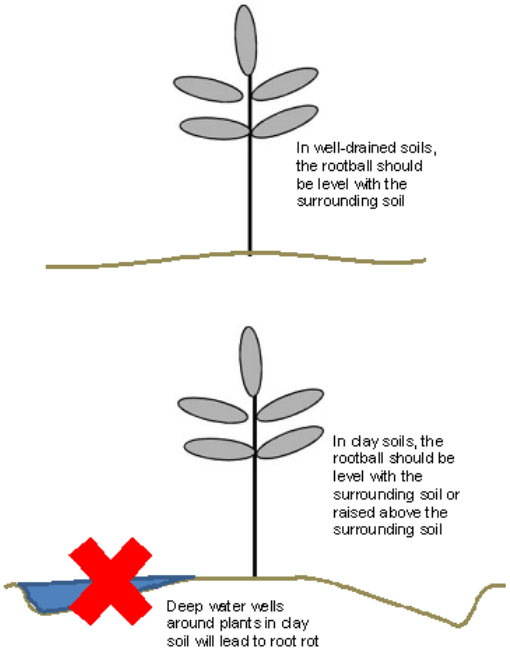
1. Deep ripping should be done with a single tyne by a small bulldozer or a suitable sized 4-wheel drive tractor.
2. Each rip line should be ripped three times as follows
   a. Twice in one direction ⟹ then once in the reverse direction ⟸
3. After each rip line is completed it should be back-bladed to break up large clods and establish a reasonable tilth for planting. If this is not possible then the tracks or wheels of the bulldozer / tractor should be run along the rip line instead.

NB Before commencing any digging or ripping the area should be assessed for the presence of service lines such as water, power & telephone.

Planting in adequate soil conditions - Planting into adequate soil conditions is similar to planting in satisfactory or ideal conditions. Please refer to general guidelines for planting in that section above. NOTE: Stock planted under these conditions should be planted so that the rootball of the plant is level with the surrounding soil.

INFERIOR SOIL CONDITIONS OR ERODED SITES – LANDSCAPE OR REVEGETATION PROJECTS

If you have a problem area that is subject to specific hostile site conditions such as little or no topsoil or excessive vertical constraints, the addition of a soil amendment or deep ripping may not be possible or may be inadvisable. In such cases a methodical and stepped approach should be undertaken to maximise the success of your planting. Initial plantstock should be limited to tubestock to minimise penetration into clay subsoils and avoid aggravating existing site disturbance or erosion problems. Each planting should be given time to establish and stabilise the immediate area around each seedling before any additional pressure is placed on the site. Seedling selection is of the utmost importance in eroded sites. Initial plantings should be limited to species that will not produce heavy, woody root systems or heavy burdens of timber via branch and trunk development that will add excessive weight to an unstable site. The amount of time needed for an eroded area to be stable enough to accept trees & shrubs increases incrementally with the degree of the slope.

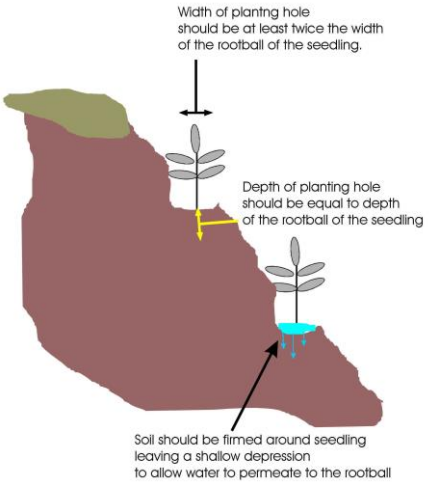


Planting into inferior or eroded soil conditions

Planting into heavy clay A surprising number of plants will grow quite well when planted directly in unmodified clay soils, however many of the most desirable plants will not. It is unwise to dig a large hole in clay soil and backfill with compost or loam. Dams are built from clay because they retain

water and a large hole dug into clay soil has the potential to be water-well and a basis for rotting roots. The ideal preparation would include deep ripping the site and then creating a mound of soil on top of the clay soil that is deep enough to accommodate the rootball of the plant without the need to dig into the clay. If this procedure is not possible then you must ensure that the clay that is dug out of the planting hole is returned as backfill around the plant – preferably as small chunks that will reconstitute themselves quickly and minimise air around the roots of the tree. Gypsum is a cost effective clay modifier and can be added to the soil during the deep ripping process or to the clay surrounding individual plant sites and to the backfill material to slowly modify the subsoil to be a more friable soil. The rootball of the plant should be level with the surrounding soil or slightly raised. Care must be taken not to create large water wells around plants in clay soils.

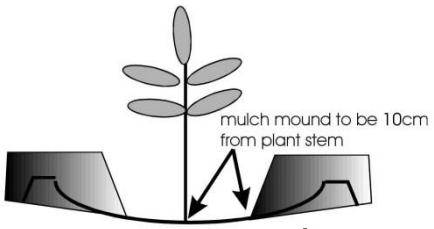
Planting into eroded sites Eroded sites can vary significantly from clay pans where the topsoil has been washed away to unstable loamy cliffs beside streams. Planting in either location must be done with a view to minimising any disturbance to the site, particularly unstable loamy cliffs. PLEASE NOTE: Planting should not be undertaken on any eroded site that presents a vertical aspect that is taller than the average person. Such areas are unstable and may collapse on the worker. Remediation works should be undertaken to batter the area and improve the stability of the site before planting. Care should be taken NOT to plant seedlings in a fashion that will create a path for fast flowing water to follow. Planting on sloping sites can be achieved using a light mattock. The planting hole should be created by digging in a lateral motion across the face of the slope if possible to avoid disturbing & loosening the soil on the slope below the seedling. The depth of the planting hole should only be as deep as the root-ball of the seedling. As far as possible the sub soil area should remain undisturbed and as stable as possible to minimise the potential for slippage. The width of the planting hole should be twice as wide as the root-ball of the seedling. The back-fill soil should be firmed around the seedling to form a shallow saucer like depression where water can pool long enough to permeate through the soil and down to the root- ball of the seedling before it cascades down the slope. Seedlings should be watered-in immediately after planting.



PROTECTION FOR SEEDLINGS

STAKING - It is preferable that tubestock is not staked. The seedling will be encouraged to provide itself with strong anchor roots if staking is not provided. Potted stock may need staking to prevent rootball movement by strong winds. Stakes should be removed as soon as possible so the trees are encouraged to produce strong anchor roots.

MULCHING - Mulch is probably the most important commodity to the survival of any plantings. Mulch protects the root zone from harsh sunlight and dry winds and allows the soil to retain moisture to keep your plants alive. Take care not to pile the mulch around the trunk of your tree as this can cause the trunk to soften and rot. Planting that is undertaken within a possible flood zone should not be mulched, it is a waste of time, energy & money that will end up polluting your watercourse when it is washed off the bank by flood waters.



GUARDS - Plastic sleeves & cardboard cartons can be used to protect smaller plants & tubestock from wind, frost & small browsing animals such as rabbits & hares & they can be retained and reused on your next planting project. Many homemade items can also be recycled and utilised such as cardboard boxes, old carpet, empty feed bags etc. Plastic sleeves should not be used for protection in flood zones as they also pollute watercourses when they are washed away by floodwaters, however cardboard cartons are a viable option in these zones as they biodegrade faster than the plastic sleeves.

MAINTENANCE GUIDELINES

GENERAL POINTS - Weeds should be controlled to avoid competition with seedlings. If herbicides are used, extreme care must be taken to avoid wind drift or overspray onto the seedlings. Although aquatics and edge of water species should not need additional watering, sites should be monitored to ensure that the planting areas do not dry out. REMEMBER - light rain showers do not water seedlings, they only wash the dust off their leaves and should not replace deliberate deep watering of seedlings.

AUTUMN & WINTER WATERING - After planting maintenance (in Autumn) should be provided as follows- Following initial watering in at the time of planting, seedlings should be watered at intervals of 3-4 days for the first 2 weeks followed by weekly watering's for a further 2 weeks and then gradually extending the time between waterings to achieve a frequency of fortnightly watering's until seedlings are established.

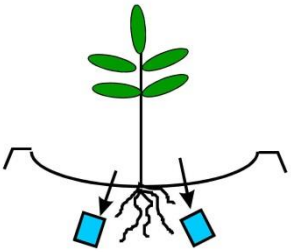
SPRING WATERING - Stock that is planted in spring must be kept moist (not wet) throughout the entire spring & summer period until Autumn the following year. Following initial watering in at the time of planting, seedlings should be watered every second day for the first 2 weeks, the watering's can be gradually extended over the following 2 weeks to achieve a frequency of weekly watering's until seedlings are established. Prevailing weather conditions

will dictate if the frequency of watering is too often or too little. Please also note the advice for summer plantings below to maximise survival of your plants.

SUMMER WATERING - Stock that is planted in summer must be kept moist (not wet) throughout the entire summer period until autumn the following year. Following initial watering in at the time of planting, seedlings should be watered daily for the first week. If the prevailing conditions are mild, the watering's can then be gradually extended to over the following 2 weeks to achieve a frequency of weekly watering's until seedlings are established. PLEASE NOTE - the root system of the average potted plant is not sufficiently developed to maintain a steady water supply to sustain your plant in extreme or hostile summer conditions. Extreme temperatures or winds over the summer period will require a return to daily watering. Prevailing weather conditions should be monitored in advance over the summer period and watering frequency adjusted **prior** to extreme heat conditions rather than after the extreme event.

WHAT ABOUT FERTILISER??

At Riverdene Nurseries we produce our own potting medium by mixing bulk raw materials to our own specifications. We pay considerable attention to the fertiliser regime for all our plant stocks and mix various slow release fertilisers (SRF) into our compost prior to tubing or potting our plantstock. Our preferred SRF's are especially formulated for the production of native plants. We use a combination of short term & long term release SRF's to provide a source of food at all stages of the plants growth including the period of time it takes for your plantstock to establish it's self after planting. If our plantstock needs additional fertiliser at any time during the growing process we top-dress them with a suitable formulation. In the case of tubestock we utilise a fertiliser that sticks to the soil surface once it has been wetted and does not fall or roll off even if the plant is knocked over. For environmental reasons, we do not use liquid fertilisers or top-dress tubestock with SRFs. The benefit of including SRF fertiliser in our potting mix is that when the stock is planted, the fertiliser within the compost continues to sustain the plant during the establishment period. For Riverdene stock planted in autumn or winter, applications of additional fertiliser can be made at any time over the following growing season (Spring & Summer). Riverdene Stock planted during the growing season should not require additional fertiliser until the following growing season unless personal preference dictates otherwise. If additional fertiliser is applied at planting, care should be taken to apply the minimum level of fertiliser or preferably a slow release formulation so you do not overdose your plants. We have noted some popular fertiliser options for you below.

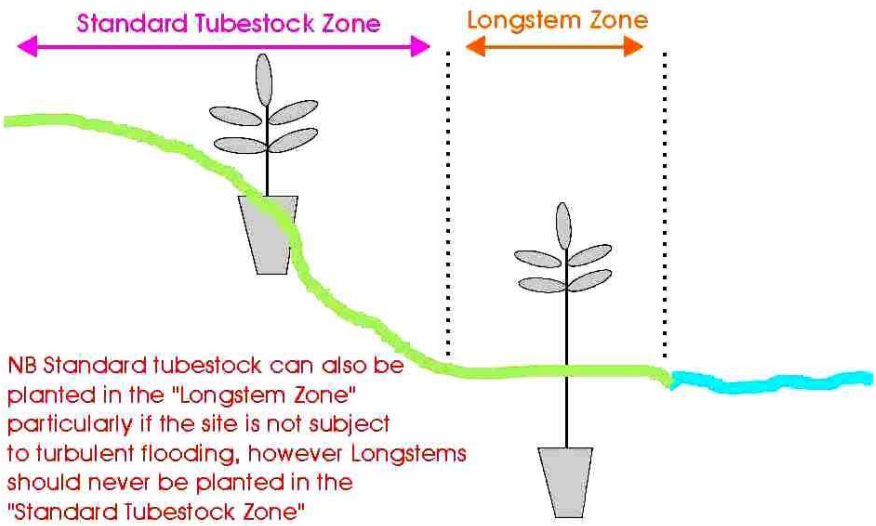


- Typhoon® Slow release fertiliser tablets are designed to be buried in the soil surrounding your plant and slowly "melt" and release fertiliser into the soil to be accessed by the roots as the plant grows. They are best applied during planting so that they can be placed low in the planting hole, below or beside the root ball and lightly covered with soil. **NB** Fertiliser should **NEVER** be placed in direct contact with the roots of the plants as this will result in root burn and retard the establishment of your plants.
- Initiator® Slow release pellets offer a combination of fertiliser and systemic insecticide in a slow release formulation to provide additional protection for your seedlings. These pellets are also designed to be utilised at planting as per the instructions for fertiliser tablets above however their smaller pellet size allows for easy subsoil installation after planting if needed.
- Sierrablen® Flora Slow release granules can be mixed with backfill soil at the time of planting or added by subsurface installation after planting or broadcast around the surface area at any time during the growing process.

Create hole using soil auger or crowbar and add pre-measured granules

WHAT TYPE OF TUBESTOCK DO I NEED?

LONGSTEMS v's STANDARD TUBES - Longstem tubes are being used more and more for Riparian restoration, rehabilitation and stabilisation works - so what are they? Longstem Tubestock is exactly what their name infers - a plant or shrub that is specifically produced with an elongated or "long" main growing stem or trunk. They are designed so that both the root ball and main growing stem of the tube can be planted deep in the soil.



The primary reason for using the longstem planting system is to anchor the rootball deep within the soil and prevent your newly planted seedlings from being literally pulled out of your riverbank by turbulent or fast flowing floodwaters until they can establish themselves.

Not all species are suited to longstem production or longstem planting. In practise a limited number of key species are utilised as longstems. Preferred species used as longstems are chosen for their ability to produce roots freely from the nodes on the stems that are to be buried, this is essential if they are to establish successfully and anchor themselves well in the soil which also means they are only suitable for deep & well drained soil profiles such as those immediately adjacent to a watercourse. As you move away from the area immediately adjacent to your watercourse you will find an increase in the density & clay content in the soil which often causes rotting of the main plant stem if it is buried deeply. Standard tubestock should be planted in these areas taking care to keep the top of the root-ball level with the surrounding soil.

It is also inadvisable to use a longstem in lieu of a standard tube, thinking that you will get a larger plant quicker. A longstem has a very dense root system confined in a small pot and is grown to be planted deep in the soil where the environment around the rootball is cool & slightly moist. For any container plant to establish itself successfully when planted out, the rootball must be able to source enough water from the surrounding soil to sustain the existing foliage and root system PLUS have some extra moisture left over to allow the roots to grow and connect with the soil around it. The root system of a standard tube will be able to feed and water itself plus establish a new root system within the soil and quickly outgrow the longstem incorrectly planted beside it whose roots are struggling to find enough moisture to keep its tall trunk and foliage alive let alone allow it to grow.

WATERING LONGSTEMS Riverdene has operated as a successful rehabilitation supplier, during periods of severe drought and also excessive rainfall and flood events. One problem that we have had to overcome was how to water Longstems during severe drought. If the root ball is buried one metre in the ground, it is almost impossible to get water to the root-ball, especially when the accepted practice is to back fill the planting hole so that air is excluded. We have found that simply inserting a piece of bamboo or giant reed cane (ensuring that it has been fully dried & cannot shoot) into the hole alongside the tube when backfilling works a treat at providing an access channel to the root ball. When you go to water the plant, simply pull the cane out, pour the water down the hole and reinsert the cane for next time. If it rains, just leave the cane there and it simply rots away – just make sure the cane is at least 13 – 15mm in diameter, or alternatively, if you have a fire pump set up with a lance for planting Longstems, simply replace the ¾ lance with a ½ inch or smaller lance, turn the pump motor down to just above idle and you can water all you like, even in so far as putting a tee-piece on the 1" fire hose and running two ½ inch hoses to get the job done quickly.

OPTIONAL EXTRAS & HANDY HINTS

WATER CRYSTALS If site access is difficult or harsh a blend of fertiliser & water crystals can be added to the backfill soil for faster establishment and reduction in watering regime.
KANGAROO / WALLABY PROTECTION Guards around seedlings will not protect from large browsers as they simply lean over the top and munch away. "Blood & Bone" provides an effective deterrent to browsers such as wallabies, hares & rabbits when it is broadcast heavily around the planting area. This treatment needs to be applied **BEFORE** the seedlings are attacked as once the browsers know there is good pick beyond the barrier their desire to feed on your seedlings will overcome their reluctance to cross the barrier. **NB - The barrier will need replacing after heavy rains.**
GENERAL BROWSER & BIRD PROTECTION Shiny reflective items such as old CD's or DVD's hung around fruit trees & seedlings will spin in the breeze and glint as they catch both the sunlight & the moonlight & will startle both browsers & birds. Strips of foil cut from old crisp packets or old wine cask bladders is a lighter alternative that will also move, glint & crinkle in the breeze & startle browsers & birds away from your seedlings.
SNAILS & SLUGS can be sent to a happy heaven by putting some beer in the bottom of a margarine container partially sunk to ground level in the garden. Alternatively a trail of coffee grounds around your plants will provide an effective barrier.
PEST SPRAY can be made by boiling Rhubarb leaves but be warned that these leaves are poisonous to humans as well as insects. Simply boil the leaves or mash them & soak in hot water. Do not consume any edibles for at least 48 hours and make sure they are well washed also. Spray will keep for 1 week however it is best used fresh.
ANTS & COCKROACHES Add a clove of garlic & a teaspoon of Cayenne Pepper to a litre of warm water and let it steep for an hour, then add a tablespoon of liquid soap & you have your own Ant & Roach spray. Ants will not cross a barrier of Cayenne Pepper sprinkled about. They are also deterred by Cloves, Citrus oil, Mint & Garlic. Bay leaves or Garlic will repel cockroaches.
FUNGICIDE Garlic is also an effective fungicide & can be used to control Brown Rot on citrus & stone fruits. Prepare spray as for the Ant & Roach direction but leave out the Cayenne Pepper. Apple Scab & Powdery Mildew can be controlled with Chive Spray, simply put a handful of Chives to soak for 15 mins in a litre of boiling water & then used undiluted. Camomile tea mix will control fungus problems such as damping off on small seedlings.
NEMATODES can be controlled by dissolving 2kg of sugar or molasses into 10 litres of water & then drenching the soil with the mix.
CITRUS SWEETENER spread 5 handfuls of Sulphate of Potash around a mature tree & then water in with a mixture of 2 teaspoons of Epsom Salts in 10 litres of water.
MOZZIES - Lavender oil or Neem Oil is a natural repellent. 1 part Lavender Oil to 5 parts water makes a good repellent spray.
FLIES - Fly deterrent include Bay leaves, Mint, garlic & Eucalyptus oil. Cotton strips soaked with Eucalyptus oil can be hung in a window to keep flies away.
FRUIT FLY CONTROL If you do not want to use systemic chemicals then a two-step approach as follows is effective.
1) Mount insect glue traps every 2m in your crop – they really work. 2) Use Naturalure Fruit Fly Bait. It contains the organic based ingredient Spinosad which kills both male & female Qld & Mediterranean Fruit Flies. You do not spray plants nor do you need to hang or clean out bait traps to use it. See us for more info - alternatively you can use a Home- made Fruit Fly lure = 1 part water + 1 part apple cider vinegar + squirt of liquid detergent.

Always remember- If you have a problem, do not hesitate to contact your supplier or other competent persons.