

# BEST PRACTICE POPPY GROWING GUIDE

## PURPOSE

One of the driving reasons for growing a crop of poppies or any other plant is to make money or more specifically profit. Profit from any agricultural pursuit including poppies is driven by a combination of three factors, these being; cost of production, price of the end product, and yield. It is yield over which the grower has greatest control hence it is the primary focus of these notes. There is always a biological limit to the yield that can be achieved from any crop at a particular site so it is important to consistently manage as many of the factors affecting it as possible in order that the biological yield potential can be approached. It is not the intention for these notes to replace the expertise of company field officers who can tailor recommendations specifically for individual paddocks, locations and poppy type. The aim of these notes is to highlight the “must do’s” or issues that must be addressed so as not to limit the potential of a crop to achieve a yield that approaches the limit of the plant for the specific season and site.

## VARIETIES

Varieties are controlled by the company (Glaxo Smith Kline, TPI & Tasmanian Alkaloids) for which a farmer is contracted to grow. Farmers can have confidence that the poppy companies have an ongoing commitment to continue development of improved poppy varieties. The experience of the company field offices will ensure seed from the variety best suited to your proposed site is supplied. This issue should not be a high priority for farmers.

## SOWING TIME

Sowing time will be dictated by a number of factors the most important of which is access to irrigation water. It is important poppies are sown early enough to ensure they have made sufficient vegetative growth prior to flowering. As a guide, poor yield results will often occur from crops sown after early October.

Growers need to be organized so as they can sow their poppy paddocks at the optimum time for their situation.

**This is a high priority.**

## PADDOCK SELECTION

Paddock selection covers a multitude of factors including soil type, slope, aspect, soil structure and soil fertility all of which can have a major influence on yield.

## Soil type

Soil type describes the physical attributes of the soil including depth available for root penetration, crusting characteristic, draining ability and water holding capacity. Poppies grow best if they have at least 250mm of top soil into which their root system can grow. This ensures sufficient soil volume is available from which the plant roots can extract nutrients and moisture. Soil volume can be increased by using raised beds.

Soils that surface crust during a drying period following rain can be a challenge to achieving a good survival of germinating poppies and other plants with small seeds.

Poppies do not tolerate water logging so paddocks prone to this should be avoided or consideration given to using raised bed technology.

Light textured soils or those with low clay content do not hold water well so growing poppies on these areas may be a challenge without irrigation.

## Slope and Aspect

Paddock slope will dictate how water runs off the area and the potential for erosion of top soil. Straw rips should be considered on sites prone to erosion due to slope or soil structure that impedes water penetration.

Aspect influences the amount of light and temperature available to plants. South facing slopes contrast to those facing north by being colder and having a lower maximum temperature which result in lower water losses by evaporation but also reduced plant performance. Crops planted on north facing slopes potentially require more irrigation water.

Soil structure describes the physical condition of the soil profile and the soil particles. Soil structure has a big influence on the ability of roots to penetrate the soil profile and on how water moves through it. It also influences the ability for seeds to make sufficient contact with the soil particles to allow water transfer between the soil and the seed. This is very important for ensuring survival of germinating seeds particularly if they are small with low nutrient reserves as is the case with poppies. Consider the impact of crop rotation on soil structure and try to plant poppies when it has not been degraded by compaction.

## Soil fertility

The soil is a reservoir of nutrients with their availability for plant growth being determined by the soil type. A soil test can provide a good indication of the nutrients available in a paddock and should be undertaken well in advance of selecting a paddock in which to grow poppies. As with all plants, poppies require a good supply of nitrogen, phosphorus, and potassium along with trace elements. Company field officers can help interpret soil tests and use them to recommend a fertilizer regime for specific paddocks.

Soil pH is one of the major factors dictating success of a poppy crop. Ideally it needs to be at least 5.8 when measured using the water extraction method. The addition of

lime can increase pH but the results are not instantaneous so it is important to apply lime perhaps a few years before attempting to grow poppies in areas with a low pH.

Some soils (particularly Ferrosols) have high levels of manganese which is detrimental to plant root growth. Increasing soil pH reduces the solubility of manganese and hence the damage it can do to plants.

**Soil factors are a high priority when considering growing poppies**

## SEED BED PREPARATION

Poppies require a well prepared seed bed, not too firm and with the surface free of turf, straw, weeds and other vegetable matter. This is very important as these materials in the soil prevent the small poppy seeds from having good contact with the soil particles thereby reducing the ability of water to flow from the soil to the germinating seed. Remember germination and seedling survival is the foundation of any potential crop so if this is poor the future prospects for crop yield will also be poor even if best practice is used.

The objective is to prepare the required seed bed initially by deep cultivation, followed by shallow cultivation with as little consolidation as possible.

Always control weeds or pasture plants with a herbicide prior to starting cultivation because many plants can survive the cultivation process when the weather is cool and moist. Large unwanted weed plants in an emerging poppy crop are very competitive for water and nutrients relative to small establishing poppy plants. They are also very hard to kill with herbicides commonly used in establishing poppy crops.

If the area to be sown to poppies is coming from a pasture it is important to commence cultivation early so as there is plenty of time for the old vegetation to rot down.

Remember some herbicides used in previous crops can have a residual activity which may be detrimental to young poppy plants so discuss the herbicide history with your poppy field officer before committing to plant poppies.

**Seed bed preparation is entirely within the control of farmers and has a significant effect on the resultant crop so it should be treated as a high priority.**

## FERTILISERS

As previously stated, poppies like all plants have a requirement for the macro nutrients being nitrogen, phosphorus and potassium. They also have a requirement for micro nutrients with boron being the most important one for poppies. This requirement can be met from a combination of using soil reserves and applied fertilizer. Your company field officer will help determine the type and rate of fertilizer required based on the plant requirements and soil test results.

Many crops develop nitrogen deficiency during December, which will reduce yield and

alkaloid concentration. Field officers can provide advice on the requirement and benefits of applying nitrogen but it is important to apply it when the plants are actively growing and water is not limiting.

## SEEDING RATE

The aim is to achieve a plant density of about 70 per square meter based on a row spacing of 150mm. This will ensure individual plants have sufficient space to grow large enough and that there are not too many plants to share the available nutrients, sunlight and water. High plant densities can also reduce air movement within the crop and increase the chances of fungal diseases as well as increasing susceptibility to lodging in windy conditions as each individual plant is weaker. The company field officer will ensure the correct seeding rate (usually around 750g/ha) is recommended which will take into account seed size including the polymer coating containing fungicide. It is the responsibility of drill operators to ensure accurate machine calibration.

## SOWING METHOD

Poppy seed is very small with the consequence that very little energy reserves are contained within the seed so in order for the germinating seedling to survive it must get its first leaves (cotyledons) into the sunlight as quickly as possible. This means that the seed should be sown within 5 – 10 mm of the soil surface with enough contact with soil to ensure moisture continues to be transferred to the seed until it develops roots. Early sown crops can be planted closer to the surface, but as the season progresses deeper depths are required to avoid drying out.

Seed also needs to be placed so as the developing plants can access the applied fertilizer but not so close that the young developing plant roots are destroyed by the fertilizer.

It is important to assess soil moisture around the seed at the time of sowing and apply irrigation if necessary. Remember supplies of moisture deep into the soil profile will not help a seed germinating near the surface. Don't hesitate to irrigate poppies sown into dry soil as this will increase evenness of germination. Split germinations make subsequent weed control far more difficult.

**Growers can control soil preparation to ensure seed is sown at the optimum depth.**

## INSECT CONTROL

Poppies like all small seeded plants are slow to establish and thus are very vulnerable to predation by pests during the establishment phase. Frequently seed quality is blamed for poor establishment when in reality the plants were destroyed by pests as they emerged. Red legged earth mites and springtails are common insect predators particularly if the paddock supported pasture prior to poppies. Similarly slugs and snails can cause serious damage particularly around the edges of paddocks adjacent to areas with good pasture that provides refuges for these pests.

There is no substitute for observation and vigilance in managing these pests. This can be achieved by visual observation, placing snail and slug bait at a series of points and observing kill rate or by using water traps. Water traps can be a container with 50mm water buried at ground level. Insects fall in and drown indicating the level of infestation and thus the need to treat.

Growers should make daily observations of their crops so as to detect and treat these pests before they cause damage which is avoidable. Field officers can provide advice but it is not their responsibility to observe your paddocks every day.

**Pest control during germination should be a high priority.**

## **WEED CONTROL**

Weeds are undesirable plants that compete with the sown crop for light, moisture and nutrients and usually grow very quickly. Most weeds in poppy crops can be chemically controlled but all herbicides have some negative effects on the poppy plants. This effect can be minimized by controlling weeds prior to sowing the crop and by making sure the poppy seed germinates evenly across the paddock. This ensures herbicides can be applied at the optimum time to minimize the damage to poppies and to maximize their impact on the weeds.

Field officers will provide herbicide recommendations but it is the responsibility of the grower to ensure it is applied at the recommended rate and at the correct time.

**Weed control should be a high priority for the grower and not just left to a field officer. Timeliness of weed control is critical to success.**

## **DISEASE CONTROL**

Poppies are susceptible to a number of fungal diseases including poppy fire, downy mildew, leaf smut and sclerotinia. Some of these can be avoided by good farm hygiene practices of cleaning up stubble, controlling volunteer poppy plants and ensuring at least a three rotation between poppy crops.

A range of fungicides are available to control these diseases and their application should be discussed with company field staff.

The role of the grower is to regularly observe the crop, not from the road at speed but by walking through it. This will enable difference in the appearance of plants to be detected and treatments applied prior to serious damage occurring. It is important to detect change in the plants, not necessarily to know the cause and to act immediately as fungal diseases can become rampant within a couple of days under ideal conditions.

**This is a high priority for growers.**

## **WATER**

Water is one of the major factors limiting the growth and yield of crop and pasture plants in Tasmania. Poppies are no exception with research clearly showing the positive effects on yield by sufficient water being available at times that are physiologically critical to the plants. These times include germination and establishment, vegetative growth, hook stage and flowering and post flowering prior to leaf senescence.

Water supply can be managed by sowing time and irrigation. Sowing early so as the plants make most of their growth before rainfall declines and temperatures increase in spring and early summer can be an effective strategy. Irrigation can remove all risk of water deficiency provided it is applied at the correct time and rate.

Restricting irrigation in the early plant growth stages to save water results in stunting of the plants. This effect will not be overcome by applying water in the late growth stages.

There are many aids to help schedule irrigation and to determine the volume of water that needs to be applied. Company field officers can also provide advice.

**Meeting the water needs of poppies is a critical success factor that can be controlled by growers.**

## **GROWTH PROMOTANTS**

Chemicals with plant hormone like activity can be applied to poppies to regulate plant growth and seed production. Their rate of application is very important so as not to have detrimental effects on the plants so accurate calibration of spray equipment is essential. The decision to use such materials should be made in collaboration with company field officers.

## **POST-HARVEST CONTROL**

Poppy stubble material can contain small quantities of opiates which if ingested in sufficient quantity by livestock can be fatal so poppy stubbles should not be grazed.

If any stock are inadvertently exposed to poppy stubble or regrowth, a three week withholding period prior to their slaughter must be observed.

There will always be seed dropped on the soil surface during harvest. This seed should be encouraged to germinate and the resultant plants killed by cultivation or herbicides. It is important not to bury seed by cultivation prior to it germinating as this increases the soil seed bank and ensures there is plenty available for germination at a later date. Poppies can be a very competitive weed in subsequent crops. Volunteer poppies can host poppy diseases which ensure they are available to infect subsequent poppy crops. Stubble can be controlled by burning or by incorporating it into the soil after any dropped seed has germinated. Volunteer poppy plants of differing alkaloid profile can contaminate subsequent crops.

The control of post-harvest residue is a legislative requirement of the licence holder.

## **SUMMARY**

Many factors affect the potential and actual yield of poppies. As discussed above many of these are under the control of the grower.

It should be remembered company field officers are available to help growers make decisions but YOUR crop is YOUR responsibility.

Profitability of any crop is inextricably linked to yield so all things that affect yield should be managed to optimise their influence.

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## **Minimise the chance of crop failure**

### **Maximise your profit by:**

**Attention to detail**  
**Observing crops regularly**  
**Timeliness of operations**

**You Need to Talk the Talk ....and Walk the Walk**

**Talk to Your Field Officer.....Walk Your Crops**