

Should I grow wildflowers? information kit

Reprint – information current in 2000



REPRINT INFORMATION – PLEASE READ!

For updated information please call 13 25 23 or visit the website www.deedi.qld.gov.au

This publication has been reprinted as a digital book without any changes to the content published in 2000. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

- Chemical recommendations—check with an agronomist or APVMA www.apvma.gov.au
- Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
- Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website www.deedi.qld.gov.au or contact the industry body.
- Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
- Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
- Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

This publication was last revised in 2000. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.

This information has been made available to assist users to identify issues involved in wildflower production. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.



Queensland Government

The FARM

The farm you need will depend primarily on what wildflowers are grown, the market(s) supplied and the overall cost of the enterprise. Wildflowers prefer a free-draining sandy soil and a frost-free site. Ready access to a reliable supply of good quality water for irrigation is essential. Close proximity to cooled transport and to markets is highly advantageous.

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Area needed

You will need a minimum of 5 ha of planting area as a viable unit for most mixed wildflower plantations or 2 ha to crop kangaroo paw as a single product line. In addition you will need land for a packing shed, office and machinery shed. For your enterprise to be profitable and sustainable you need to plan ahead. Issues to consider in selecting the land area you will need are: the number of people to be supported by the business, whether it is a full or part-time venture and whether you are targeting the domestic or export market. Consider also that you will need additional space to accommodate expansion and rotation of the land.

Soil

Drainage

Wildflowers generally grow best in internally well-drained sandy soils free from heavy clay, rock or other impermeable layers within 1 m of the surface. Some soils such as the (basaltic) red volcanic krasnozems,

although high in clay content, have physical properties that allow good internal drainage, which make them suited to some wildflowers, however this is uncommon amongst clay soils.

A simple test for good internal drainage can be conducted on test holes bored with an auger to the rooting depth of your proposed crop. At the start of the test the soil must be fully wetted down the profile, either following good rain or after the hole has been drained fully after being filled with water. Pour about 5 L of water into the hole. In light- to medium-textured soils the water will drain away in less than one hour, and should be suited to most wildflower crops. If ponding is prolonged, particularly if it exceeds eight hours, your soil is likely to have drainage problems rendering it unfit



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Scholtzia mounded on a sandy loam soil at Emerald in central Queensland



for most wildflower crops.

Drainage in marginal or otherwise unsuitable soils can sometimes be improved by the use of mounding or sub-surface drains. Mounding is common in higher rainfall coastal areas. If the soil drainage is unsuitable for the wildflower species you want to grow, find an alternative species or a different crop.

Nutrient levels and pH

An acid soil, with a pH range from 5 to 7, is best for most wildflowers.

Before you start any land preparation and before planting the crop, obtain an accurate assessment of your soil type and its nutrient status. Soil type, prior land use and previous applications of fertiliser will affect the nutrient status of your soil. You can buy soil sampling kits from rural supply stores; take the samples yourself and send them to the laboratory for analysis and interpretation.

Many wildflowers have much more specific, and sometimes narrower, nutrient needs than fruit, vegetable and broad acre crops. Yields have been correlated against soil test levels in only a few developed wildflower crops. Seek experienced advice from a wildflower crop specialist or the DPI's Crop Health Services on the interpretation of your results. This will influence what wildflower types you can grow and fertiliser application rates.

Phosphorus levels, for example, need to be determined before you decide what to plant, as some Australian native species are sensitive to high levels of available phosphorus. If your soil phosphorus level is higher than 50 parts per million (Colwell method), seek specialist advice.

Although some wildflower crops will tolerate saline soil conditions, problems with soil salinity will be compounded by the use of poor quality water and too much fertiliser. Table 10, page 75 indicates appropriate salinity levels for both soil and water according to crop tolerance.

Biological activity

Knowledge of previous land use on the farm is important to determine if there are any potential disease and pest problems that may limit the wildflower crop you can grow. *Phytophthora* root rot is perhaps the worst disease of wildflowers. It can be spread with infected plants, such as potted planting stock; by movement of contaminated soil on machinery and footwear; and in irrigation from dams or creeks that collect runoff from *Phytophthora* root rot affected areas. Irrigation water may need to be treated to minimise the spread of *Phytophthora*. Several water treatment methods are available, including: chlorination and/or bromination; micro- or sand-filtration; ozonation and ultra-violet sterilisation. Chlorination is the most common method.

Root-knot nematodes are another major problem, particularly if the area was previously planted to highly susceptible crops such as tomatoes and legumes and nematode numbers have built up. Get a soil test done for nematodes or conduct your own bioassay. Do this before you start any land preparation and before planting your crop. You can treat the soil with Nematicur™ for nematodes, but it is expensive and may not be very effective in the long term. Longicorn borer can be found at injurious levels in blocks surrounded by native vegetation or neglected former plantings. Termites (white ants) may be a problem in some parts of northern, central and western Queensland.

Control pests and diseases by the use of pathogen-tested planting stock, preplant assay, regular crop monitoring, cultural means and the strategic use of chemicals.

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Slope and aspect

Slopes of less than 15% are suitable, provided the farm layout is designed to minimise erosion (that is, planted with the contour of the land). Steeper slopes present a major erosion risk, make it difficult to operate machinery safely, can cause problems with irrigation flow and also make access for hand pruning and picking difficult. Plantings on a slope may be subjected to more wind movement (with potential for damage), but have lower humidity and less disease. In high rainfall coastal areas, planting on slopes may improve surface runoff and help to reduce soil-borne disease problems.

Aspect refers to the direction a slope faces. It influences temperature, plant growth and evenness of flower opening in wildflowers such as King Proteas. A warmer aspect is preferred to a cooler one. Slopes facing north and east are best as they face the winter sun and are protected from south-east and south-west winds in southern Queensland. South-facing slopes are cooler in winter and face the prevailing winds in southern Queensland. West-facing slopes are the least suitable, as they are exposed to strong cold westerly winds in winter and are very hot in summer. Depending on your crop, aspect can be used to influence flowering time and delay or advance harvest time.

Badly eroded land of any slope or aspect should be avoided, as it is costly to repair.

Land cost

Growing wildflowers is a high risk, capital and labour intensive, high cost enterprise. The cost involved in servicing a loan needs to be considered before you buy land. Prepare a comprehensive property development and business plan, preferably with professional help, before you buy land and start your enterprise. Don't plan a development that is too large or buy expensive land that overcommits your available funds.

Water supply

A reliable supply of good quality water for irrigation is essential to grow high quality marketable flowers and foliage. You will not get a good crop if you do not monitor soil moisture levels to determine how much additional water is needed to that provided by rain. Several soil moisture monitoring devices are available, but evaporation pans and tensiometers are most commonly used on wildflower farms. Trickle irrigation is the most popular watering system. Overhead irrigation may predispose plants to foliage diseases.

Water sources may include bores, rivers and on-farm dams. Check with the Queensland Department of Natural Resources on the status and/or availability of pumping licences on any streams. Always manage your runoff water to prevent soil erosion on your own and neighbouring properties.

The amount of water needed will depend on location, type of crop



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Climatic factors
The farm
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grown and area, annual rainfall, rainfall distribution, evaporation and evapotranspiration of the crop. Here are some examples of water requirements:

- **Emerald:** Maximum requirement for a mixed planting of wildflowers, irrigating over a full year, in addition to incident rainfall, is 8–9 megalitres of water per hectare per year. Mean annual rainfall at Emerald over the past 100 years is 650 mm (100 mm of rainfall over 1 ha is equivalent to 1 megalitre).
- **Toowoomba:** The irrigation requirement for 2000 rice flowers over a full year, in addition to incident rainfall, is 4 megalitres of water per hectare. Mean annual rainfall at Toowoomba over the past 100 years is 950 mm. To give one week's supply of water in January from a turkeys nest dam, allow a supply capacity of at least 1.6 megalitres (1600 cubic metres).

Advice on dam construction, irrigation systems and site specific information is available from the Queensland Department of Natural Resources.

Water quality

Water quality cannot be determined by taste. Obtain a chemical test to see if it is suitable for irrigating wildflowers before you plant your crop. Plants are sensitive to salt levels in the water. It is best to use water with a chloride content of not more than 220 parts per million (0.65 milliSiemens per centimetre). Table 10 (modified from R.J. Shaw, 1982¹) gives a general indication of the tolerance of plants to salinity. A list of Australian native species tolerant of saline soils can be found in the Australian Plant Study Group publication *Grow what where*.

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Publications—ornamental crops
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Table 10. Tolerance of plants to saline water

Plant salt tolerance group	Soil salinity level	Soil salinity reading EC * ** mS/cm	Irrigation water quality EC mS/cm	Irrigation water quality Chloride ppm
Sensitive crops	Very low	< 0.15	< 0.65	< 220
Moderately tolerant crops	Medium	0.30 – 0.70	1.30 – 2.90	440 – 800
Tolerant crops	High	0.70 – 1.20	2.90 – 5.20	800 – 1500
Generally too saline for crop growth	Extreme	> 1.90	> 8.10	> 2500

* Electrical conductivity (EC) 1:5 soil:water extract

** 1 mS/cm = 1000 μ S/cm

Water is also a potential source of plant pathogens (organisms capable of causing disease in plants). Follow these rules of thumb.

¹ Shaw, R. J. (1982) Submission to the Australian Society of Soil Science Salinity Terminology Committee. Unpublished Internal Report. Agricultural Chemistry Branch, DPI.

- Bore water is generally considered free of plant pathogens but can have a high salt content.
- Dam water may contain plant pathogens and may need treatment (for example with chlorine).
- Creek or river water may also contain plant pathogens and may need treatment.
- Chlorinated town water is generally suitable without further treatment.



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Trial plot of wildflowers at Alpha in western central Queensland

Trial block

To keep up with market demands, set aside a trial area for assessing new varieties and their suitability for your farm. This way, as market demand changes, you will be able to alter the product that you grow to meet the demand. Trial blocks tend to become untidy, with a mixture of plants at different stages of growth and various levels of vigour. These areas are best managed away from larger, more uniform commercial plantings.

Climatic factors

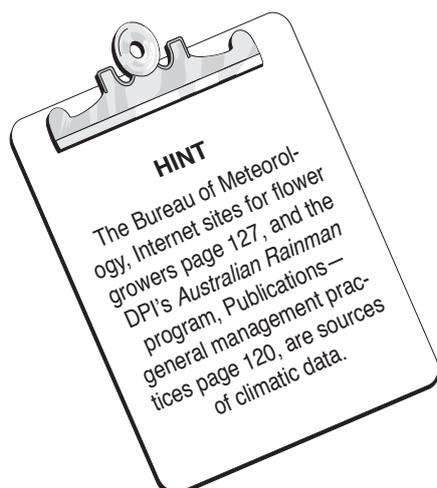
Temperature

When choosing a site, try to avoid extreme temperatures and areas with high wind velocity. Be aware of the maximum and minimum temperatures in your locality. Temperatures of 35°C and higher may cause flower buds to drop in some plant species or bracts to turn brown on some *Protea*. High temperatures also make crop establishment difficult.

Many species are sensitive to frost. The critical times for frost are during plant establishment and flower development. Frost may damage or destroy the harvested product on plants such as *Protea*, waxflower, kangaroo paw, *Eucalyptus tetragona* and *Eucalyptus erythrocorys*. Young plants are sensitive to frost and may be killed even though that variety or type is tolerant when mature. If planting in autumn, tree guards may be necessary to protect sensitive species during the colder months.

HINT

The book, *Australian climate/weather services and the use of the information*, Publications practices—general managements practices, page 120, is a free directory available from the DPI bookshop. *Agricultural booksellers* page 109.



Rainfall and humidity

The amount of rain your property receives is important, but so is its distribution throughout the year. High summer rainfall with extended periods of high humidity is associated with an increased incidence of disease. For some crops, such as *Protea* 'Pink Ice', continuous rain can abort buds and damage flowers, making them unsaleable. For many others, rainfall at harvest time can delay the harvest and create difficulties in maintaining postharvest quality.

Fungal pathogens may be a problem if high humidity (including fog or dew) coincides with a lack of wind. Planting in valleys can exacerbate this situation. This is usually more of a problem in coastal areas of Queensland than in drier inland areas. These conditions can cause various leaf and flower diseases such as anthracnose (caused by the fungus *Colletotrichum*) in *Protea* and grey mould (*Botrytis*) in waxflower.

Evaporation

Evaporation is a major factor to be considered in assessing the extent of supplementary irrigation needed to grow a crop. Also the rate of evaporation, and hence evapotranspiration, can be expected to be greater for inland and lower latitude locations, increasing the need for supplementary irrigation. For example, the average annual pan evaporation at Toowoomba is 1800 mm; the same figure for Emerald is 2200 mm (22% higher).

Environmental issues

Wildflowers may need regular sprays for diseases, insects and weeds. Highly populated areas are best avoided, as nearby residents often complain about noise and the use of chemicals. The Environmental Protection Act 1994 covers issues such as the containment of runoff, noise levels and waste disposal.

Be aware of the crops that are being grown or are likely to be grown by neighbouring farms, as spray or vapour drift from aerial spraying of 2,4,5-T or ground use of hormonal herbicides such as 2,4-D may damage your wildflower crop. Areas of natural bush (national parks and reserves) can also be a source of insect pests like the longicorn beetle and vertebrate pests such as feral pigs.

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Proximity to transport and markets

As wildflowers are a highly perishable product, consider where you might market your product and how it will be moved. Access to regular, reliable, refrigerated or cooled transport is preferable. The further away you are from your market, the more important it is to maintain your product in a cool state. The distance from your market affects, but is not the sole determinant of, your transport costs. Table 11 gives some freight costs. It is intended as a guide only.

Table 11. Some example freight rates within Queensland and to Sydney and

Melbourne

	Approximate number of kilometres	Cost to transport a 10 kg flower box
Road transport from Malanda to Cairns	75	\$4.00
Refrigerated road transport from Malanda to Townsville	400	\$5.00
Refrigerated road transport from Emerald to Brisbane	950	\$5.60
Refrigerated road transport from Jandowae to Gatton	160	\$4.00
Air transport from Emerald to Sydney	1360	\$7.20
Refrigerated road transport from Gatton to Sydney	1000	\$1.90
Refrigerated road transport from Gatton to Melbourne	1700	\$4.20

To overcome the difficulties of transporting fresh flowers and foliage from relatively remote areas, some growers buy extra time for, and add value to, their products through drying and preserving. This requires appropriate infrastructure, including storage areas; expertise; additional labour and, here needed, the use of preserving and dyeing chemicals.



DAVID HOCKINGS

Dried arrangement featuring *Bracteantha bracteata* and *Stenanthemum*