

The good oil on safflower in Australia

Safflower is an underutilised crop that fits into Australian grain production systems. It uses existing machinery and gives growers more strategic pest and weed control options, management flexibility and reduces production and economic risks. For example, sowing safflower in spring provides an opportunity to generate income from paddocks that receive additional cultivations or other controls to manage herbicide resistant winter weeds.

This later sowing and harvest than traditional winter crops can help spread peak workloads over a longer period of time. Despite these and other potential benefits, the area sown annually to safflower has been erratic and now is less than one per cent of the cropped area in Australia.

History in Australia

Australia began to investigate safflower in the 1940s amid concerns for drying oil shortages in the paint and resin industries. Several cultivars were subsequently introduced from overseas, allowing small scale commercial production to commence in the mid 1950s.

The cultivar Gila was introduced in the early 1960s from the US and with higher seed and oil yields the safflower industry expanded to 42,000 hectares in 1968. At this time, safflower was mainly grown in Queensland, but production subsequently declined due to droughts in 1968 and 1969, followed by several seasons of above average rainfall which favoured the disease, *alternaria*.

Production continued in Queensland and expanded into other states at varying levels, but in 1975 grower confidence was again lost by a severe outbreak of *alternaria* in Queensland. During the 1960s and 1970s cotton and hybrid sunflower industries expanded and created competition for the safflower industry.

The abolishment of quotas on the use of vegetable oils for margarine production in 1976 led to increased interest in oilseed production and in the following seasons record prices were paid for safflower. The area sown in Australia subsequently peaked in 1979 with 74,688 hectares, but then declined presumably due to volatile prices and competition from other oilseed crops.

In response to disease concerns, the



David Jochinke (left) speaks to growers at a recent safflower field day.

CSIRO developed the cultivars Sironaria, with resistance to *alternaria*, and Sirothora with resistance to the root pathogen *phytophthora*. These were released in 1987.

But this did not revive safflower production in Queensland, with production over the past two decades shifting largely to New South Wales and Victoria. During this period the Australian industry was based largely on Sironaria which has high levels of linoleic oil and is also suitable for birdseed markets. In comparison, dedicated oilseed cultivars with higher oil contents have been developed overseas.

Some of these cultivars, including S555 (linoleic oil) and S517 (oleic oil) were introduced into Australia in the 1990s expanding market opportunities. Further cultivars have been imported by companies in recent years, but production is still limited due to irregular cultivar testing, seed propriety issues and the availability of commercial seed quantities.

Several companies have attempted to expand safflower production in Australia, but in recent decades the larger processors have tended to concentrate on other oilseeds like canola, sunflower and cotton. Markets for safflower have therefore tended to be less stable than the major oilseeds resulting in greater price volatility. This combined with disease outbreaks,

unsuitable cultivars, unfavourable seasonal conditions and competition from more profitable crops has resulted in the erratic production of safflower in Australia over the past 35 years.

Constraints on production

Safflower requires more water than other crops commonly grown in the traditional wheatbelt to produce comparable yields. It has found a strategic niche in some wetter situations where it is regularly sown by some growers, but in general the run of seasons with below average rainfall over the past decade have not favoured the inclusion of safflower in cropping rotations.

Notwithstanding this issue a number of other constraints have and continue to restrict safflower production in Australia. These relate to the availability of suitable cultivars, production practices and the economic viability of safflower to growers.

In recent years the Australian safflower industry has relied on Sironaria and a handful of cultivars imported from the US. Whilst these are adequate to service linoleic oil, oleic oil and birdseed markets, they are not adapted to the broad range of environments within the wheatbelt, particularly. In contrast, the wide range of canola cultivars

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available offer choice in length of growing season, disease resistance and herbicide tolerance increasing the adaptability of this crop.

Safflower has gained a reputation as being a summer or opportunity crop and as such, it is not always sown at the optimum time or with adequate inputs contributing to poor or variable yields. In at least some situations, this indicates a poor understanding about safflower production requirements and the half-hearted attitude of some growers and agronomists towards the crop.

Safflower in Australia is marketed as birdseed and for vegetable oil. Birdseed markets are relatively small and easily

flooded due to the speculative nature of production leading to large price variations between seasons.

To some extent, the more structured production of vegetable oil has improved price stability, but seasonal influences have disrupted the continuity of supply which could reflect on Australia's ability to supply export markets. This supply issue is amplified by safflower being a minor crop with little carry over stock held in reserves, making the whole industry highly sensitive to unforeseen production or marketing issues.

To be competitive with other cash crops, growers would like to achieve similar gross margins from safflower and this has not always been the case. Safflower requires about an extra 120 mm of water to pro-

duce similar yields to canola and in July 2008, the indicative market price for safflower and canola delivered to Melbourne was \$555 per tonne and \$770 per tonne, respectively.

Given that safflower has a higher water requirement and a lower price, at present it may not be competitive with canola as a cash crop unless some strategic value can be gained by including safflower in rotations.

Opportunities for safflower

Safflower provides diversity to cropping systems and a different sowing window to spread economic and production risk and to spread machinery usage.

Domestic demand for safflower oil is currently small, but export markets in India, Japan and other countries are being developed. Other opportunities may come through increased demand for edible vegetable oils, or more recently, biodiesel. For example, Riverina Oils and Bioenergy Pty Ltd have proposed to construct an oilseed factory at Wagga Wagga, NSW to process 165,000 tonnes of safflower and canola per year into biodiesel and refined vegetable oil.

Genetically modifying safflower to produce other products may also create new market opportunities. One example is a project being undertaken by the CSIRO to transform safflower into a bio-factory to produce epoxy fatty acids that could be used to produce biodegradable plastics. Reducing the proportion of seed husk or developing more lucrative markets for meal may also increase the profitability of safflower to processors with flow on benefits to growers.


The continued run of dry seasons in Australia combined with concerns for the health of many waterways is placing increasing pressure on many irrigated cotton and rice growers. Limited availability, or increases in the price of water, may render these crops unviable in some regions in the near future creating an opportunity for safflower.

Safflower has deep roots and providing sufficient water is available, it is tolerant of maturing under hot summer conditions. This combined with a flexible time of sowing could create further opportunities for safflower if climate variability results in more frequent wet springs or autumn or winter conditions that prevent the establishment of traditional winter crops.

This is an abbreviated version of two papers by Nick Wachsmann, David Jochinke, Trent Potter and Rob Norton which will be presented at the 7th International Safflower Conference. ■



To be more competitive with cash crops like canola, safflower needs more strategic value in rotations.



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