



IRRIGATED CROPPING FORUM

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## OILSEEDS NEWS

### BENEFICIALS CAN BEAT BELLIGERANT BUGS



**MONITOR, MONITOR, MONITOR:** Hugh Brier shows participants how to monitor beneficial and pest insects in a soybean crop with a beat sheet. Beat sheets and magnifiers were given to each workshop participant.

Photo: Felicity Pritchard.

Cheaper, more toxic, broad-spectrum chemicals can do more harm than good in controlling insect pests of soybeans and actually exacerbate pest problems.

This was one of the learnings from an integrated pest management (IPM)

training workshop held in Griffith last week, following listening to soybean insect ‘guru’, Hugh Brier.

Kingaroy-based Brier is a senior entomologist with the Queensland Department of Primary Industries and Fisheries, and has an extensive knowledge of what are considered ‘hard’ and ‘soft’ options for managing insect pests in soys, adzuki and mung beans.

The workshop covered crop growth stages, integrated pest management philosophy, insect identification, monitoring, thresholds and insecticide options, and was followed by some crop monitoring at David and Paul Bellato’s Coleambally property.

Dr Brier said that in Queensland, previous insecticide resistance in corn earworm, *Helicoverpa amigera*, and the lack of options to control whitefly had more-or-less forced growers to adopt IPM. In the Riverina, he believed that spider mite (two-spotted mite) may be the driving force for IPM adoption.

“My aim is to get people enthused and active, and become local champions for IPM,” he said.



**FINER DETAIL:** Hay soybean grower, Nick Maynard, with NSW DPI entomologist Joanne Holloway take a close-up view of insect life through the microscope. Photo: Felicity Pritchard.

Dr Brier demonstrated the importance of beneficial insects in keeping populations of insect pests low by acting as parasites or predators of pests, and said that native insects play a far greater role than most people probably realise.

Dr Brier said the first IPM strategy for soybeans is to “go soft early”.

“Use only biopesticides before flowering. Reserve the new ‘soft’ pesticides for ‘helis’ (ie *Helicoverpa*) at podding. Also, delay for as long as possible the spray for pod-sucking bugs (such as green vegetable bugs) until early pod-fill – even if they are there already”.

By using only the more selective biopesticides early in the crop's life, the beneficial insect populations can build up quickly, and keep the number of pests in the crop at a manageable level. The more toxic, broad-spectrum insecticides not only kill pests, but can kill many beneficial species which otherwise help keep pest levels low. Often this leads to a 'flare-up' of red spider mite, also known as two-spotted mite, attacking soybean crops in the Riverina and northern Victoria.

"They are the classic secondary pest. A soybean crop close to a maize crop is much more at risk, and hot, dry weather makes it worse. Unlike with other species, crops are at risk from mites until maturity," he said.

However, Dr Brier said that growers had limited IPM option to control pod-sucking insects later in the season, which can severely reduce soybean grain quality if it is used for making products like tofu and soy milk.

"We have a problem with implementing IPM strategies in soybeans during pod-fill, as there is only effective registered option," he said. This chemical is broad-spectrum and will take out many beneficial insects as well as the pests.

Dr Brier explained to participants the importance of close monitoring of soybean crops and basing spray decisions on economic thresholds for the maximum economic yield and best quality grain.

An economic threshold is considered a break-even point where the anticipated cost of damage by the insect population is equal to the cost of control.

"Spraying is only recommended when insect numbers exceed the economic threshold for yields. Just how far above the threshold a pest population is before you take action is an individual judgement, based on how confident you are in your monitoring and the cost of control.

You may prefer to wear more damage if you're into IPM and want to foster your 'beneficials'. It's so important to continually monitor your population. If none of your grubs are getting big, then obviously they're being taken out (by beneficial species)".

Dr Brier pointed out that soybeans have many reserve pods. Early damage can be compensated for more than the yield thresholds suggest, as the crop sets far more pods than what gets through to harvest.

“Each ‘heli’ can eat more than 100 buds, flowers and small pods. They’re not called budworm for nothing,” he said.

He said that crops in the vegetative phase can tolerate defoliation of one-third of their leaf area without any yield loss, or as much as 40 per cent when factoring in the cost of controlling the insects; but this drops back to 15 to 20 per cent during flowering and podding.

The actual percentage of defoliation can be deceiving to the naked eye, and may look far worse than it actually is, he said.

However, the thresholds for preventing damage to grain quality are actually lower than economic thresholds, to avoid further reduction in quality.

“Unlike the economic thresholds for yield, you can lose a lot of money if you stray over the threshold for quality. Therefore take action before you reach the threshold for quality,” said Dr Brier.

He said that lower yielding crops could not handle as a high a density of pod-sucking insects as bigger crops, as the percentage of grain damages would be higher.

Dr Brier demonstrated a computer simulation model which showed how to work out whether or not to spray a crop for insects for damage to grain quality.

Agronomists attending the workshop said that Dr Brier’s knowledge and the information he shared was a real highlight of the day, and learnt a great deal of the importance of beneficial insects in controlling insect pest populations.

They said that they will now consider economic thresholds before recommending spraying, check crops for beneficial insects and identify species, use softer chemicals in the early stages of crop

growth and check out all the options. They also said they will now record what's in the paddock and use the 'beat sheet' provided to all participants.

The workshop was funded by the Oilseeds Industry Development Officer and the Better Oilseeds-Better Soybeans projects of the Australian Oilseeds federation and Grains Research and Development Corporation, as well as the National Invertebrate Pest Initiative of the GRDC; and Bayer Crop Science. It was also generously supported by the time and efforts of Felicity Pritchard, Irrigated Cropping Forum, Trevor Bray, Pulse Australia, and Luke Gaynor, Kieran O'Keeffe, Sandra McDougall and Joanne Hollaway of NSW DPI as well as the key presenter, Hugh Brier.

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## DOUBLE CROPPING WITH SOYBEANS FIELD DAY A SUCCESS

A hot barbecue breakfast consisting of sausages, cinnamon bananas, French toast, mushrooms, tomato, onion, maple syrup and good old bacon and eggs was served to about 30 Riverina growers as the sun rose over a neighbouring soybean crop in southern NSW on 18 March.

But that wasn't all that was on the menu. Growers were also served up a wealth of invaluable information about double cropping with soybeans at Paul and David Bellato's irrigation property on the outskirts of the township of Coleambally.

The meeting and crop inspection covered soybean varieties, water use patterns, management, IPM and growers' personal experiences with soybeans. Also on the agenda were talks by about irrigated barley, the Better Oilseeds project, risk management



**SOYBEAN GROWER:** David Bellato hosted the double cropping field day on his Riverina property. Photo: Felicity Pritchard.

for canola and pulse crops. David Bellato gave a review of how they sow their crops, their rotations and what yields they have achieved.

The barbecue breakfast was funded by the Oilseeds Industry Development Officer project of the AOF and GRDC.

The field day complemented a separate double cropping field day for northern Victoria facilitated by the Victorian DPI and Victorian Irrigated Cropping Council in February, which showcased the final season of a three-year trial.

Coleambally District Agronomist with NSW DPI, Kieran O’Keeffe, summed up what he thought of the day with the statement: “The day was really successful in that it provided information to blokes (and ladies) who now have to think differently because of the lack of water.”

He said once upon a time, 80 per cent of irrigation water in the area was used on rice crops. The rice crop is now at around 2 per cent of its normal area, now with a similar area to soybeans in southern NSW.

Soybeans are low water-use crops compared with other irrigated summer crops and have the benefit of a very short growing season, allowing them to fit in between successive winter crops for a very water-use efficient farming system. Soybeans are also a much lower-cost summer crop than maize, which was particularly important to growers at present as input costs skyrocket.

In fact, David Bellato said that no fertiliser was used in his soybean crops, instead relying completely on residual nutrients from the preceding winter crop.

“The day focused on more stable crop rotations,” Mr O’Keeffe said.

Some growers in the region have not grown soybeans for a long time, and are being educated about the new generation of higher yielding varieties that have a shorter growing season which allows for double cropping.

NSW DPI soybean and pulse research agronomist, Luke Gaynor said that Djakal and Snowy preferred culinary varieties for the region.

“Outclassed and not preferred are the varieties Curringa, Bowyer and Stephens.”

Mr Gaynor told the growers that soybean crops in the Riverina could be sown as late as Christmas with only over small yield penalties, allowing for soybeans to be sown after a late wheat crop. Very few summer crops have this advantage. The early maturity of newer varieties also allows for a winter crop to be sown after the soybeans are harvested, even if sowing in late in December.

Growers were reminded that early maturity was important as it allows harvesting of the soybeans in late March, early April before autumn rains begin.

Mr Gaynor has also conducted long-term time of sowing trials on soybeans as part of his research work with the National Soybean Improvement Project funded by GRDC.

He said in the last five years or so, that he found very little yield difference between plots sown from the week of 20 November and those sown a month later. Temperature at the end of the season was an important factor, as cooler below average temperatures slow the development of the plant. That is why it is so important to plant as early as possibly, to help guard against cool finishes, he said.

However, he said plant densities needed to be slightly higher with the late sowing to achieve similar yields – boosted from 30-35 plants per square metre to 40-45 plants per square metre when sowing late. From mid December is considered late.

“Sowing from mid November is highly desirable, and this is the ideal situation. But the ability to sow later gives you a lot more flexibility in terms of double cropping,” he said.

Luke said that yields penalties increase significantly for Southern soybean crops sown after Christmas.

“If you sow after Christmas, this will reduce the amount of biomass prior to flowering, which translates into yield loss. The crop will never reach full canopy by mid-flowering.”



**WATER WISE:** Luke Gaynor demonstrates the moisture probes in one of David and Paul Bellato's soybean crops which are part of the Better Oilseeds project. Photo: Felicity Pritchard.

He also advised growers to never cut corners with December sowing and to use high quality seed at higher sowing rates.

Consultant irrigation agronomist, Paul Hudson, also showed growers graph of water use patterns in a soybean crop on the property.

The Better Oilseeds – Better Soybeans project in conjunction with NSW DPI and Coleambally Water Smart has help fund water use monitoring to look at water use within soybeans on raised beds.

Enviroscan probes were used to monitor soil water movements and “Irrimate” equipment to measured flow rates on and off the field, infiltration rates, water application efficiency and the distribution uniformity. This work identified an opportunities to save small amounts of water per hectare per irrigation.

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## NEW SOYBEAN MARKETING GUIDE



**NEW MARKETING GUIDE:** Berrigan soybean buyer, exporter and seed merchant Arthur Dempster is listed in the new soybean manual. Photo: Felicity Pritchard.

A new free soybean marketing guide has been released for Australian growers to give them a better idea of quality requirements of buyers and to find out what marketing options they have.

The new guide list the contact details of nearly all Australia’s soybean buyers, as well as their quality criteria



such as grain size, defective grain, contaminants and the oil, protein and moisture content.

The guides have been a hit with growers who received them at the recent North Coast field day at Casino, as well as the double cropping field day near Echuca in Victoria.

The guides will be distributed to all holders of the North Coast soybean growers' manual and the southern soybean growers' manual.

To obtain a hard copy, contact Felicity Pritchard on (03) 5382 4396. They can also be downloaded from

the AOF website at [www.australianoilseeds.com](http://www.australianoilseeds.com). The guides were compiled by Oilseed Industry Development Officer

(OIDO) Felicity Pritchard and have been funded through the OIDO project of the AOF and GRDC.



**KNOW YOUR OPTIONS:** Soybean grower Craig Reynolds and Victorian DPI agronomist Dale Boyd check out the new Australian Soybean Growers' Guide at the recent double cropping field day near Echuca. Photo: Rohan Pay, Vic. DPI

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