

<b>Title</b>	Benefits provided by treating canola seed with Imidacloprid seed dressing
<b>Description</b>	Research Update - Southern Region - February 2003
<b>GRDC Project*</b>	UWA 313
<b>Authors</b>	Roger Jones Brenda Coutts Lisa Smith and Jenny Hawkes Department of Agriculture and Centre for Legumes in Mediterranean Agriculture Paper Reviewed by Martin Barbetti
<b>Presented</b>	Wagga Wagga and Temora NSW

\*Note - this report may contain independently supported projects which complement the work in this GRDC research program.

### Take home messages

- In two field experiments in 2002 dressing canola seed with imidacloprid (525gai/100kg of seed) controlled insecticide-resistant green peach aphids (GPA) and effectively suppressed spread of beet western yellows virus (BWYV) for 2.5 months.
- At Avondale the overall combined yield reduction caused by BWYV and direct GPA feeding damage was 47%. Seed dressing used alone increased seed yield by 88%. At Badgingarra the overall yield loss caused by BWYV and GPA feeding damage together was 50%. Seed dressing used alone increased seed yield by 74%.

### Background

Imidacloprid is a multipurpose new chemistry insecticide belonging to the neonicotinyl group. It kills a range of pests including insecticide-resistant GPA the principal vector of BWYV.

It is available as a seed dressing (Gaucho®) or a foliar spray (Confidor®). Gaucho® is already registered for control of red-legged earth mite and blue oat mite in canola and information to support its registration for aphid and BWYV control in canola is currently being sought. In the grainbelt of south-west Australia aphids spread BWYV to canola crops from infected weeds especially wild radish.

In surveys in 1998 and 1999 BWYV was found in 59% and 66% of canola crops sampled respectively. In two field experiments in 2001 infection with BWYV that started early and reached 98% and 93% of plants decreased seed yield of canola by 37% and 46% respectively.

### Methods

In the 2002 growing season at two Department of Agriculture Research Station sites (Badgingarra and Avondale) field experiments with BWYV and canola cv. Pinnacle were done to provide information on the effectiveness of imidacloprid seed dressing (Gaucho®) and foliar application of alpha-cypermethrin (Fastac®) against BWYV and insecticide-resistant GPA.

To ensure early BWYV spread and high final incidences of infection small numbers of canola plants infected with BWYV and infested with GPA were introduced into plots in

each experiment. Imidacloprid seed dressing (Gaucho® 600 FS at 525gai/100kg of seed) and alpha-cypermethrin (Fastac® at 25gai/ha) applied at three and seven weeks post emergence were used.

Aphids were counted before and after spray applications. Each plot was sampled fortnightly to determine BWYV incidence and the samples tested by TBIA using BWYV specific antiserum. Harvest and threshing was by standard practices.

## **Results**

In plots without Gaucho® seed dressing BWYV spread very quickly in young plants causing symptoms of leaf reddening and plant stunting that were absent in healthy plants.

Patches of BWYV-infected plants within plots without seed dressing also showed direct feeding damage due to GPA (severe stunting leaf downcurling) sometimes resulting in plant death. In control plots without insecticide BWYV infection reached 97% (Avondale) and 99% (Badgingarra). In both experiments the Gaucho® seed dressing dramatically increased growth vigour and height of the canola plots while the foliar Fastac® insecticide did not.

BYWV spread and GPA numbers were effectively suppressed for 2.5 months after sowing by the seed dressing but the early foliar sprays provided no control at Avondale and little at Badgingarra. At Avondale the overall combined seed yield loss caused by BWYV infection and direct feeding damage from GPA was 47% (Fig. 1).

Seed dressing used alone increased seed yield by 88%. At Badgingarra the overall seed yield loss caused by BWYV and feeding damage from GPA together was 50% (Fig. 1). Seed dressing used alone increased seed yield by 74%.

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## **Conclusions**

This research shows that when GPA arrive in canola crops just after emergence and spread BWYV early the early control of GPA and BWYV achieved with imidacloprid seed dressing is sufficient to increase yields dramatically.

Although these results represent a 'worse case' early aphid arrival scenario they have potentially wide reaching implications for the canola industry.

Once a suitable application rate is registered the seed dressing has the potential to provide effective multipurpose control not only of aphids including insecticide-resistant GPA and BWYV but also of other early insect and mite pests of canola.

We thank RSU staff for technical support at Avondale and Badgingarra Bayer Crop Science for the seed dressings and the Grains Research and Development Corporation for funding.

**Fig. 1. Effect of insecticide treatments and the control achieved on yield of canola.**

A = Fastac® at 3 and 7 weeks after emergence + infector plants; B = Gaucho® treated seed + infector plants; C = Gaucho® treated seed + Fastac® spray at 3 and 7 weeks + infector plants; D = no insecticide + infector plants; E = no insecticide - infector plants; F = Gaucho® seed treatment + Fastac® sprayed at 3 7 11 and 15 weeks - infector plants. Bar = Isd.

