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FarmLink Research Report 2019

Managing early season canola pests in NSW

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Trial Site Location NSW

Introduction

Canola is a major cash crop in NSW and has benefits for the cropping rotation as the main break crop for cereals. In many systems, canola often follows pastures, benefiting from the nitrogen fixed by legumes during the pasture phase. This strategy means canola faces high pressures from various arthropod species that commonly inhabit and infest pastures. The widespread change to zero till has also benefited many pest species, or species not previously regarded as pests, whose habitat has been enhanced by the increase in stubble. Canola is subject to attack by more than 30 species of invertebrate pests, although the composition of this pest complex varies between regions.

This project consisted of two objectives. The first was to put together the technical material in a new easy-to-read guide for growers and advisors (Managing Early Season Pests of Canola, BMP Guide) and the workshop material (PowerPoint and practical activities). This was done with the CESAR Pestfacts team of Dr Jessica Lye and Julia Severi and the FarmLink extension team (Phil Bowden, Melina Miles, Don McCaffery, Penny Heuston, Peter Watt, Lisa Castleman, Zorica Duric and James Holding). The second objective was a March 2019 roadshow to 15 NSW locations, from at Croppa Creek in the north to Deniliquin in the south. The FarmLink team brought considerable agronomy, pest management and presentation skills to deliver the workshops, crop walks and webinar. Activities included hands-on workshops, paddock walks and discussion groups, giving growers and advisors the opportunity to interact with the presenters and receive the most current and practical pest management advice. This was followed by an interactive webinar by CESAR on Green Peach aphid (GPA), the resistance management plan for GPA and the range of parasitic wasps found in canola.

The response was excellent, with 190 growers and advisors attending across the state. Pre and post-workshop surveys conducted by RCMG showed they had improved grower and advisor knowledge of key pests and their natural enemies, pest identification, monitoring methods, pest population dynamics, pest lifecycle/ecology/biology, off-season hosts/green bridges, environmental/seasonal population drivers, damage symptoms, economic thresholds, farming system impacts, biological, chemical and cultural control options, and other factors leading to better management and reduced incidence of poor establishment in NSW.

Project Partners

FarmLink

BRS Bowden Rural Services

Funding Partners

GRDC Grains Research & Development Corporation

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Managing early season canola establishment pests in NSW

The canola industry has become a major part of agriculture in Australia, both in terms of value to farmers and value adding post-farm gate. The area of canola grown is around 2-3 million hectares with an output of around 4 million tonnes. This translates to a farm gate value of $2 billion. In addition, there are four major processors based in regional NSW (Wagga, Wagga, Manildra, Cootamundra and Newcastle) adding value to the product and increasing local jobs both on-farm and in these secondary industries across NSW.

Farmers have finetuned their management of the crop to reduce the production risks over the past 20 years, but canola is host to many of Australia's most damaging invertebrate pests, which can prove particularly challenging to crop establishment. Farming systems have changed over the years to become more efficient with resources, but this has meant changes to the range of pests at different times of year, or when canola is grown in different sequences to other rotation crops. Pest species include mites (redlegged earth mites, blue oat mites, Bryobia mites and Balaustium mites), wireworms/ false wireworms (bronzed field beetle, Eastern false wireworm, grey false wireworm, vegetable beetle and true wireworm), weevils (Mandalotus weevil, grey-banded leaf weevil, spotted vegetable weevil and vegetable weevil), slugs (black keeled slug, brown field slug, grey field slug), cutworms, lucerne flea, green peach aphids, common white snails, Rutherglen bugs, slaters, black Portuguese millipedes and European earwigs.

Invertebrate management in canola is complex and requires a multifaceted understanding of not only the species that are detrimental to plant production, but also the natural enemies that prey on these plant pests, the cultural methods and chemical controls that can be used. To effectively manage pests, a good understanding of the species is paramount. This includes the lifecycle, biology, behaviour, alternative host plants and insecticide resistance status. The species of crop establishment pests attacking canola vary considerably.

For example, the green peach aphid (GPA) is a vector of turnip yellows virus in canola, and can also overwhelm plants by direct feeding when in high numbers. It has a wide host range and is resistant to many chemicals. Redlegged earth mites causes silvering or white discoloration of leaves and distortion or shrivelling in severe infestations. They can threaten many later-sown crops and are difficult to control with chemicals. Slugs, weevils and cutworm can consume entire areas of establishing canola but occur only rarely in large numbers when conditions are favourable. They can be kept in check by a range of natural enemies at most times.

The sustainable management of canola pests is often termed Integrated Pest Management (IPM). It uses a variety of techniques to suppress pests, and pesticides are often not the first line of attack. IPM in canola begins with correct species identification. Misidentification of invertebrate pests can result in unnecessary insecticide applications or incorrect insecticide choice. However, in the field, many pests are difficult to distinguish by the untrained eye, and education and resources are often required to discern subtle difference between species or invertebrate groups.

The project presented the latest research and current information about early-season pest management, and assisted advisors and farmers in identifying the range of pests and natural enemies they will encounter in canola-growing areas around NSW.

The methodology involved several different concepts in getting messages across to diverse groups who may have different learning styles. The latest research findings were presented using a 'top-down' approach, with evidence from respected researchers. Hands-on activities such as insect identification exercises gave learners confidence by touching, feeling and hearing. Discussion group forums gave a 'bottom-up' approach where everyone could have a say, with farmers learning from farmers.

Scheduled activities varied to get engagement with local growers and advisors.

1. Getting local farmer and advisor groups together to interact with experienced presenters to show the range of options and BMP for managing insect and mite pests. By using locally known agronomists, farmers and advisors were encouraged to attend the activities during the season. Media presentations publicised the activities (rural press, ABC radio, social media, web and email networks)
2. An introductory pre-season workshop showed Best Management Practice guidelines, monitoring techniques, management options and introduced the support network. This was done as a roadshow starting at Croppa Creek in northern NSW and working south through 15 locations to finish in Deniliquin at the end of March.

   https://grdc.com.au/resources-and-publications/all-publications/publications/2019/insect-pests-of-establishing-canola-in-nsw
3. A YouTube video and podcast were done in emerging canola to show techniques for monitoring pests and natural enemies.

   https://grdc.com.au/news-and-media/audio/podcast/insect-pests-of-establishing-canola-in-nsw
4. A follow-up paddock walk after crop establishment looked at pest and natural enemy occurrence in the crop, showed monitoring techniques, the control strategies that could be used and the likely progression of the pests for this season, depending on the seasonal conditions, crop residue and soil conditions. Open discussion with local advisors and farmers demonstrated a range of experiences, and the group worked out what works best for their region.
5. The group learning used hands-on activities, presentations from experienced entomologists and agronomists, and general open discussion about all the options for better pest management. BMP guides were used for the important pests for their localities and participants were able to have their questions answered in an open forum. An important aspect of these workshops and crop walks was to mentor young agronomists and farmers learning about pest management from experienced advisors and farmers sharing advice, and to develop networks of support for decision making. One of the interesting outcomes has been the sharing of information across groups since the workshops/crop walks, using photos taken on mobile phones with a small macro lens that was distributed at the workshop. It has led to greater co-operation, and some excellent photos being used to help decide whether pest control is required, or if natural enemies will keep pests in check. Participants were able to increase their knowledge of the pest groups that affect their crops, use monitoring techniques to find pests and receive support to enable them to make control decisions.
6. A webinar was presented in early spring (and put up later as a GRDC YouTube presentation) to give growers and advisors the latest information about current pest problems (including GPA), resistance management strategies and the latest research on parasitic wasps that are found in canola.

   https://www.youtube.com/watch?v=Pp68mJJgt3o&feature=youtu.be
7. A season review was done in early 2020 to discuss the different pest occurrence and control results from the range of strategies used.

Canola Pest Workshop Notes

Learnings from the roadshow:

- Mostly agronomists participated in these workshops, but it was agreed that it is farmers that need to be making the decision to try IPM, rather than the current common practice of early season insurance sprays with broad-spectrum insecticides.
- Both commercial and independent agronomists do not want to be responsible for crop damage when insecticide costs are low and the consequences are high for pest damage.
- Damage/economic thresholds need more research. There were lots of questions about when to spray or when to leave it to the natural enemies.
- Beneficial/pest interactions need research to give some empirical data on numbers of beneficials needed to give control of pests.
- Some pest problems (e.g. GPA virus transmission) are causing growers to have reduced confidence growing canola, especially in lower rainfall areas, where crops are often stressed and targeted by aphids.
- Some previously important pests (mites) are not such a problem now, with the move to earlier sowing times (for reasons other than pest management), but other pests are becoming more prevalent (associated with higher stubble retention and earlier sowing).
- There was unanimous agreement that the BMP (Best Management Practice) Guide is an excellent reference.
- The combination of the workshop followed by a crop walk mid-season and webinar was welcomed to give practical experience to younger agronomists.

Canola Crop Walk Notes

- Crop walks attracted a greater number of farmers rather than advisors.
- In the central and northern areas of the state (Parkes to Moree) drought conditions prevailed and area planted to canola was greatly reduced compared to previous years.
- Many canola crops had been grazed or baled for silage or hay in spring, as a result of the dry conditions, stressed crops, high prices for livestock and high demand for feed.
- Most crops had relatively low insect pressure early in the season, predominately aphids and a few caterpillars (DBM, Brown Pasture Loopers).
- There is an increasing number of aphids showing up in spring, especially GPA, cabbage and turnip aphids, but in general these are well controlled by natural enemies (high numbers of parasitic wasps have been observed). GPA were prevalent from late summer/early autumn, especially on early-sown winter varieties.
- The crop walks were well attended and there was a lot of interest by growers and young agronomists to identify all the natural enemies found with pest species.
- There was great enthusiasm by the agronomists to use the macro lenses that were distributed at the workshops to photograph and assist with identification of pests and natural enemies.
- The BMP guide produced by CESAR was well regarded and a great resource for farmers and advisors. The Ute Guides and Back Pocket guides were also well received.
- Many of the crop walks were combined with talks about grazing/baling canola, as a result of the deteriorating soil moisture conditions in many regions. There was a lot of interest in following up on this topic, to deal with animal health issues when grazing canola, so a grazing canola forum was held at Wallendbeen (Cootamundra) to bring the agronomy and vet expertise together. We ran the Canola Insect webinar at the conclusion of this forum.
- The Condobolin walk was in conjunction with the annual CWFS/AGnVET field day.

Monitoring and Evaluation of the activities

M & E of the project was carried out by RCMG (Melbourne, led by Carl Larsen).

The data provided by the pre-workshop and post-workshop hard-copy surveys, the mid-season paddock walk online survey and the post-webinar survey have altogether painted a positive picture of the achievements of the project relating to increased knowledge and practice change in management of early season canola establishment pests in NSW. After completing the pre-season workshops in March 2019, almost all respondents stated that they intended to use or advise on IPM practices in their farming system. The pre-workshop survey detected some knowledge of canola pest and beneficial invertebrates, but certainly scope for and interest in improvement, and a general willingness to learn more about management of establishment pests in canola. The post-workshop survey detected initial gains in knowledge and confidence across all topics covered, from identification to management. Intention to change management practices was relatively high.

The mid-season paddock walks consolidated the knowledge and motivation of growers and advisors to implement IPM in their farming systems. In addition, it is positive to see the high rate of actual practice change since attending the previous workshops. For those who had not attended the previous workshop series, the information gained at the paddock walks was still considered useful.

In a challenging year for many canola (and other crop) growers with drought conditions, the sessions were highly regarded. A particularly valued aspect of the paddock walks was collective discussions about local-scale issues drawing on local knowledge and experience. Similarly, interacting with peers and networking were viewed as great benefits of the paddock walks. This mode of learning (i.e. peer-to-peer) is known to be particularly influential, in this case to optimise improving knowledge and practical application of pest and beneficial identification and IPM principles.

From those who attended both the pre-season workshop and the mid-season paddock walk, there was an impressive list of actual practice changes enacted since the workshop, such as increased monitoring, reduced and more selective insecticide use, and greater confidence in beneficials. Even further improvements in motivation, attitude and ability may be possible after the knowledge gained or reinforced during the paddock walk refines insights for growers and advisors.