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Implementing IPM in autumn-sown wheat in New Zealand using a participatory approach

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Introduction

Integrated pest management (IPM) is an approach to pest control that aims to maximize the use of beneficial insects whilst minimizing unnecessary insecticide use. For farmers to undergo a change in practice from a routine broad-spectrum spray programme to an IPM approach, they need a better understanding of the benefits of IPM and what it involves.

This poster reports on a project initiated by a group of enthusiastic arable farmers who wanted to see a robust comparison between conventional pest and disease management and an IPM approach.



Female *Aphidius* standing on a hoverfly larva injecting an egg into an aphid.

Methods

Six crops of autumn-sown wheat managed under IPM were compared with six adjacent crops grown under the farmers’ current pest management practices in farmer-participatory demonstration trials in Canterbury, New Zealand (2008-09 and 2009-10).

- Decision-making using IPM was based on monitoring the presence and abundance of key pests and diseases (slugs, aphids, yellow dwarf virus (YDV)) and beneficial parasites and predators.
- Farmers and agronomists were trained to use simple monitoring techniques to identify pests and beneficial parasites and predators, and were involved in the monitoring and decision-making.
- Where insecticides and molluscicides were required, selective chemicals were used (if available).

Results and discussion

There was an increasing trend in the number of beneficial organisms, a reduction in pests, and a 50% reduction in the number of insecticides applied (Table 1) in the IPM-managed crops compared with the conventionally managed crops. Conventional crops had fewer beneficial carabid beetles after applications of lambda-cyhalothrin (Figure 1).

Table 1: Insecticides used on the integrated pest management (IPM) and conventionally-managed crops for the six autumn-sown wheat crops, Canterbury, New Zealand. All sites and crops were established with imidacloprid-treated seed except the conventional site “E”.

Site	Sowing date	Conventional insecticide foliar application	IPM insecticide foliar application
A IPM	28 April 2008	2x lambda-cyhalothrin 10 g/ha (as Karate®)	None
B IPM	29 April 2008	1x pirimicarb 125 g/ha (as Pirimor®), 1x lambda-cyhalothrin 5 g/ha (as Karate)	1x pirimicarb 125 g/ha (as Pirimor)
C IPM	8 May 2008	1x lambda-cyhalothrin 5 g/ha (as Karate)	None
D IPM	23 April 2009	1x lambda-cyhalothrin 5 g/ha (as Karate)	None
E IPM	5 May 2009	2x lambda-cyhalothrin 5 g/ha (as Karate)	None
F IPM	5 June 2009	1x lambda-cyhalothrin 5 g/ha (as Karate)	None

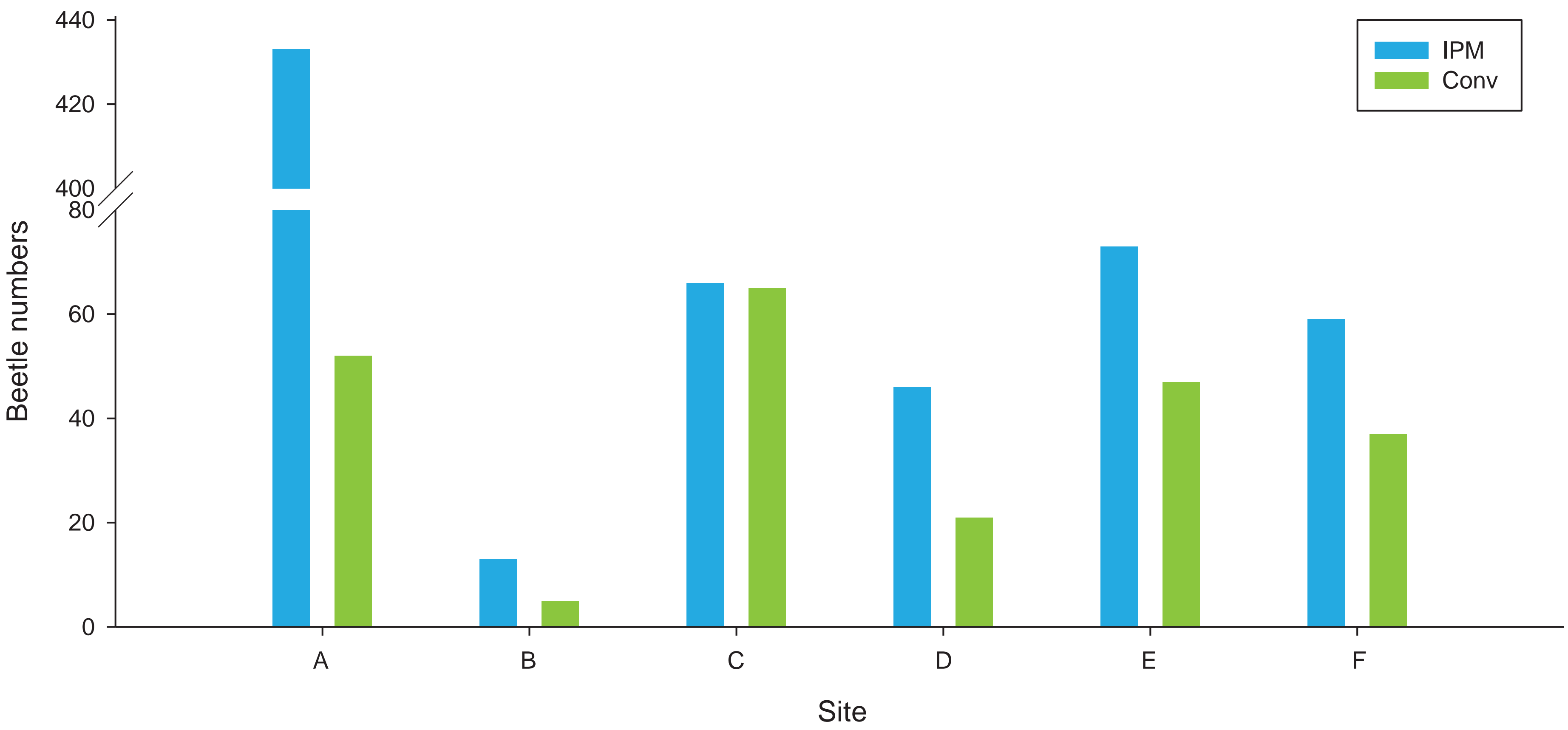


Figure 1: Carabid beetle numbers in integrated pest management (IPM) and conventionally managed crops for the three monitoring dates combined after lambda-cyhalothrin had been applied to the conventional wheat crops, Canterbury, New Zealand.

There were negligible yield differences between the IPM and conventionally managed crops ($P=0.391$) for both the early- and late-sown wheat crops (April–June). Likewise, the Yellow Dwarf Virus (YDV) assessments carried out at the flag leaf stage for both seasons found there to be no differences in YDV ($P=0.886$) between the two management approaches.

Based on the experience of IPM extension and uptake programmes in Australia, it takes 3 years of support before farmers undergo a change in how they approach pest management (Horne et al. 2008). Over the 3 years of this project, the farmers underwent a change in practice from a routine broad-spectrum spray programme to an IPM approach. The collaborative and participatory approach taken was a key factor contributing to this shift in pest management.

Survey results indicate there have also been changes in awareness regarding the use of an IPM approach to pest management beyond the arable farmers participating in this project. A comment received in the farmer survey sums this up: “There has been a significant change in attitude and a widespread acceptance that IPM is a legitimate way of controlling pests, even if not all growers choose to use it. For those farmers that choose to base their program of insecticides on broad-spectrum sprays, they now accept other options are possible”.

Conclusion

The two years of this study have demonstrated that an IPM approach can allow arable farmers in New Zealand to obtain good control of pests without compromising quality of pest management. It has clearly demonstrated that the method of using farmer-participatory trials can deliver a change in practice as well as increased awareness within the wider arable sector.