



## Broflanilide insecticide controls wireworms

CATEGORY [insects](#) | December 9, 2020

Broflanilide provided consistent protection against wireworm damage in wheat, and also reduced neonate and resident wireworm populations at levels similar to the deregistered lindane but at a far lower dosage per acre.

Wireworm has reemerged as an insect pest in cereals, corn, potato, and vegetables crops since the 2000s. This followed the de-registration of lindane (Vitavax) seed treatment in Canada in 2004 and the United States in 2007. Lindane was highly effective in preventing crop damage from feeding wireworms. It was also highly effective in killing the majority of wireworm resident populations (those already in the field at planting), and was persistent enough to kill the majority of new neonate wireworms arising from adult click beetle eggs.

Since the de-registration of lindane, control options for this pest complex have been limited, particularly in Canada. While several neonicotinoid insecticides (Group 4) have been registered as seed treatments for controlling wireworms in cereal crops, these only provide protection from feeding damage, and do not effectively reduce wireworm populations.

Laboratory research has found that neonicotinoids cause rapid and long-term intoxication/morbidity of several species of wireworm, resulting in the loss of mobility and inability of wireworms to feed, but allowing them to recover and survive to feed and reproduce the following year.

Another insecticide Lumivia, (diamides; Group 28), has been registered for wireworm control in western Canada. Research has found that it also provided early season wheat stand protection when applied to seed, but like neonicotinoids, did not reduce wireworm populations.

A new class of insecticide named broflanilide (Group 30) was initially tested by researchers at the Agassiz Research and Development Centre (ARDC) at a single rate in 2012, and found to be highly effective in reducing wireworm populations. Broflanilide was developed by BASF and Mitsui Chemicals Agro., Inc.

Subsequently, the researchers, Drs. Bob Vernon and Wim van Herk, conducted small plot field trials at ARDC with multiple rates of broflanilide from 2013 to 2019. All study sites had been in continuous pasture or cereal crops for at least 10 years, and preliminary sampling indicated that high populations of *Agriotes* wireworms were present. These particular *Agriotes* pest species are native to Europe and arrived to the east and west coasts of Canada in the 1800s.

Pheromone trapping for these species at ARDC found *A. obscurus* to be the predominant species in the adult stage at greater than 90%. No other non-*Agriotes* species of wireworms were detected in bait traps (for wireworms) or pitfall traps (for click beetles), indicating that *A. obscurus* was likely the primary species with *A. lineatus* present as a minor species.

In the trials, broflanilide was compared to various classes of insecticide seed treatments for wireworm control, including: neonicotinoid (thiamethoxam, Cruiser 5 FS); diamide (cyantraniliprole, Fortenza); phenyl pyrazole (fipronil, Regent 4SC); and organochlorine (lindane, Vitavax Dual) insecticidal wheat seed treatments. Not all seed treatments tested are registered for wireworm control in western Canada.

### **Effective wheat stand protection and high wireworm mortality**

When evaluated in field trials over 7 years at various rates, broflanilide was as effective at protecting wheat stands from wireworm injury as the current industry standard thiamethoxam (Cruiser 5FS).

Broflanilide also reduced neonate wireworms produced from eggs laid in established wheat during the growing season by an average of 73%, and resident wireworms in the field at time of planting by

an average of 81%. This is comparable to, and better than that reported for lindane, and shows that broflanilide will provide consistent wheat stand protection equal to thiamethoxam, and *A. obscurus* wireworm population reduction equal to lindane, but will do so at far lower dosages per acre.

BASF Canada Agricultural Solutions has since received registration for broflanilide from Health Canada's Pest Management Regulatory Agency (PMRA) in October 2020 and will be available in two formulations.

Teraxxa F4 insecticide and fungicide seed treatment is registered in wheat, barley, oats, triticale, rye and canary seed. It includes four fungicide active ingredients in a pre-mix for broad-spectrum protection against seed and soil-borne diseases.

Cimegra insecticide is an in-furrow or T-band at planting application that controls wireworm in potatoes, and wireworm and corn rootworm in corn.

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Willem G van Herk, Robert S Vernon, Lindsey Goudis, Terisha Mitchell, Broflanilide, a Meta-Diamide Insecticide Seed Treatment for Protection of Wheat and Mortality of Wireworms (*Agriotes obscurus*) in the Field, *Journal of Economic Entomology*, toaa239, Open Access:

<https://doi.org/10.1093/jee/toaa239>

VAN HERK, W. G.; LABUN, T. J.; VERNON, R. S.. Efficacy of diamide, neonicotinoid, pyrethroid, and phenyl pyrazole insecticide seed treatments for controlling the sugar beet wireworm, *Limonioides californicus* (Coleoptera: Elateridae), in spring wheat. *Journal of the Entomological Society of British Columbia*, [S.l.], v. 115, p. 86-100, mar. 2019. ISSN 1929-7890. Open access:

<https://journal.entsocbc.ca/index.php/journal/article/view/1002>

Photo by Wim Van Herk, AAFC.: *Selatosomus destructor* is up to 2.5 cm in length, while *Hypnoides bicolor* can grow to 1.0 cm, and are commonly found on the Canadian Prairies. Teraxxa F4 is registered for control of all wireworm species.