WASHINGTON STATE UNIVERSITY
EXTENSION

MANAGING WIREWORMS IN DRY LAND CEREALS

2014

BY THE NUMBERS

- More than 1,700 growers across the United States have increased awareness and knowledge of wireworms.
- Approximately 1,172,000 acres have been impacted by this research.
- Growers are seeing an increase in profits of up to $215/acre with adoption of new practices.

ISSUE

Wireworms are a common pest of many crops in the Pacific Northwest and can inflict severe damage, causing huge economic losses. This is especially damaging to cereal crops grown in dryland farming systems in eastern Washington. Despite the use of seed-applied insecticides, wireworm populations (*Limonius* spp.) continue to grow, and crop damage continues to rise. In eastern Washington, more than 100 growers were sent wireworm trap kits and surveyed in the spring of 2008. Sixteen percent of respondents found wireworm populations at levels high enough to indicate the potential for severe economic damage.

Multiple factors have led to increased wireworm populations and damage, including the Conservation Reserve Program, increased crop residue, and intensive cropping associated with direct seeding and conservation tillage.

RESPONSE

WSU Extension secured funding and product donation to initiate on-farm testing (OFT) for wireworms in the spring of 2008. This OFT focuses on profitably managing wireworms with crop rotations and seed-applied neonicotinoid insecticides in spring cereal grain production. Additional funding, from the Washington Grain Commission in 2010, helped complete this series of OFT and initiate a study examining new insecticides with the potential to control wireworms and gain product registration. In 2011, this project was the first recipient of the Washington State University Distinguished Professorship Research Endowment established by the Washington Grain Commission to address priority research needs within the Washington wheat industry. This endowment, over the next three to five years, will provide $60,000 per year for WSU research and Extension.

Extension efforts include a grower education project with the following objectives:

- Help eastern Washington cereal grain producers profitably manage wireworms with crop rotation, cultural controls, and registered insecticides; and
- Examine potential new insecticides to control wireworms and gain product registration.

The three primary teaching methods have been wireworm research field tours, speaker presentations, and publications, including web pages. Field tours include hands-on wireworm identification, wireworm crop damage diagnosis, and implementation of a wireworm scouting program using the wireworm trap-and-shovel method.

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QUOTES

"As a wheat grower in Washington, I have experienced the extensive problems caused by wireworms. Problems associated with wireworms in our region have been rapidly expanding in recent years, and we are seeking solutions that will improve sustainable management of these pests. Research and education that promotes wireworm management is helping us raise better crops and make our operation more successful."

"With proper wireworm diagnosis and control, I have seen a signification increase of yield and return over costs."

"High wireworm levels caused severe reductions in plant stand, grain yields, and test weight. Applying new knowledge has led to significantly higher yields."

IMPACTS

This WSU Extension project started in 2008 as a simple OFT with a $1,000 budget and some donated seed. Today, the project has grown into a multi-state and multidisciplinary comprehensive wireworm management research program. This project has positively impacted the Washington cereal grain industry and surrounding region.

Grain growers have increased their awareness and knowledge of wireworms as a direct result of the WSU Extension project. Data from surveys of 242 growers in 2008 and 289 growers in 2012 show:

- A 69% increase in respondents' ability to identify wireworms;
- A 68% increase in their ability to diagnose wireworm damage; and
- A 57% increase in scouting for wireworms.

OFT results have led to critical behavioral changes in growers and changed the industry across the region. At the inception of this project, neonicotinoid insecticides were being applied at 0.19 ounces per hundredweight (oz/cwt). In 2010, the industry standards were increased to 0.315 oz/cwt. Today, based on OFT results, standard application rates are between 0.50 and 1.00 oz/cwt (greater in heavily infested fields). At one area seed plant in 2008, only 10% of the seed sold was treated for wireworm control. Now, more than 90% is treated. Results of a WSU Extension phone survey of four major seed dealers in the region indicated that more than 85% of wheat seed is treated with at least 0.50 oz/cwt and approximately 10% is treated with 2.0 oz/cwt.

For one local grower who hosts an OFT, applying recommended wireworm treatments during the four years of the study translated into an increased profit of $172,000 from an 800-acre field. When considering the relationship between this program, behavioral changes in growers, and shifts in the industry, this program has had a multi-million dollar impact across the region.