

2-6-2015

Field Experiments Show Effects of Clariva™ Seed Treatment in 2014

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Recommended Citation

Tylka, Gregory L.; Marett, Christopher C.; and Robertson, Alison E., "Field Experiments Show Effects of Clariva™ Seed Treatment in 2014" (2015). *Integrated Crop Management News*. 308.

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Abstract

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Keywords

Plant Pathology and Microbiology

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

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Field Experiments Show Effects of Clariva™ Seed Treatment in 2014

By Greg Tylka, Chris Maret, Alison Robertson, and Mauricio Serrano-Porras, Department of Plant Pathology and Microbiology, Iowa State University; Tristan Mueller, Iowa Soybean Association On-Farm Network

Clariva™ Complete Beans is a seed treatment from Syngenta for management of the soybean cyst nematode (SCN). Clariva Complete Beans contains Clariva™, with the active ingredient *Pasteuria nishizawae*, a bacterium that parasitizes SCN. Clariva Complete Beans also contains the seed treatment insecticide and fungicides that are in CruiserMaxx® Advanced and Vibrance®.

Coordinated, cooperative experiments

In 2014, personnel from Iowa State University (ISU) and the Iowa Soybean Association (ISA) On-Farm Network® worked together to study the effects of Clariva on soybean yields and SCN soil population densities in experiments conducted throughout Iowa. There were nine small-plot experiments and 15 strip trials in SCN-infested fields in 2014 (figure 1). The soybean variety Asgrow® AG2433 (with PI 88788 SCN resistance) was used in the nine small-plot experiments and eight of the 15 strip trials. Seven of the strip trials had SCN-resistant soybean varieties other than Asgrow AG2433. All 24 of the experiments compared the seed treatments Clariva Complete Beans versus CruiserMaxx Advanced plus Vibrance.

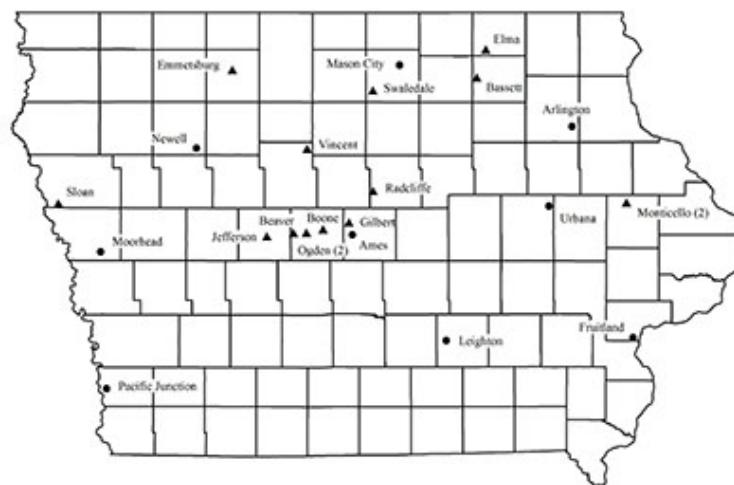


Figure 1. Location of small-plot experiments (circles) and on-farm strip trials (triangles) comparing the effects of Clariva Complete Beans versus CruiserMaxx Advanced plus Vibrance on soybean yield and SCN population densities in Iowa in 2014.

Each small-plot experiment consisted of 12 replicate plots of the two seed treatments. Plots were 17 feet long and four rows wide with 30-inch spacing. Three of the small-plot experiments were located across northern Iowa, three

across central Iowa and three across southern Iowa (designated by the circles in figure 1). SCN population densities were determined from soil samples collected from the center two rows of each plot at planting and again at harvest, and yields were collected from the center two rows of each plot as well.

Each strip trial had the two seed treatments replicated at least three times; most trials had 5 or more replications of each treatment. Individual strips were 12 to 24 rows wide (mostly 30-inch row spacing) and 1,000 to 1,500 feet long. The strip trials were located across northern and central Iowa (triangles in figure 1). Soil samples were collected from designated sampling points in the strips after planting and near the time of harvest in many, but not all, of the strip trials. Yields were determined from each strip in every trial.

The data from the small-plot experiments were analyzed separately from the strip trial data, but yield difference results are presented together in figure 2. Also, data from the small-plot experiments were combined and analyzed for the three geographical regions of Iowa separately (northern, central and southern Iowa) and for all nine experiments in Iowa combined.

Effects on yield

- Overall average yields ranged from 46.3 to 72.4 bushels per acre among the nine small-plot experiments and from 36.8 to 91.5 bushels per acre among the 15 the strip trials.
- The yield differences between Clariva Complete Beans and CruiserMaxx Advanced plus Vibrance ranged from +4.6 to -2.2 bushels per acre overall in the small-plot experiments and strip trials (figure 2), with an average of +0.6 bushels per acre. The overall average yield difference was +0.2 bushels per acre in the small-plot experiments and +0.8 bushels per acre in the strip trials.
- In eight of the 24 experiments there was a significant difference between yields of the two treatments (figure 2). Differences were significant if there was an 80 percent or greater probability that the detected yield differences were due to treatment effects.
 - There were five experiments in which significant yield increases from Clariva were detected, three in strip trials and two in small-plot experiments.
 - In two strip trials and one small-plot experiment there were significant yield decreases associated with Clariva.

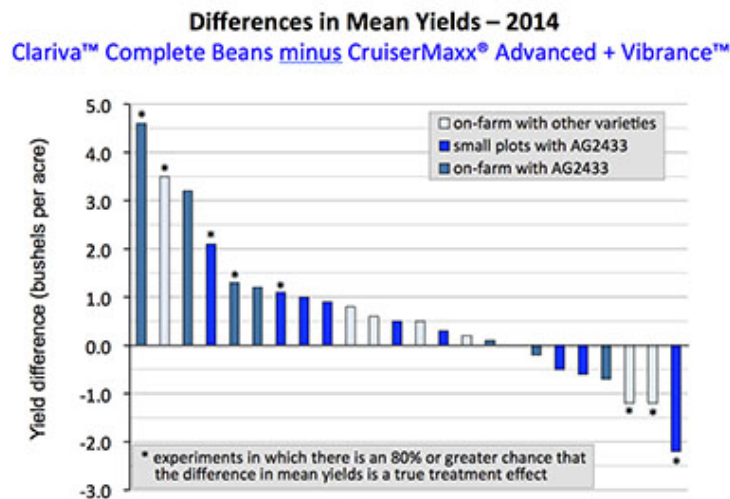


Figure 2. Difference in mean yields of SCN-resistant soybean varieties with Clariva Complete Beans and with CruiserMaxx Advanced plus Vibrance in small-plot experiments and strip trials conducted in 2014. Values greater than 0.0 indicate that the mean yield of the Clariva Complete Beans treatment was numerically greater than the mean yield of the CruiserMaxx Advanced plus Vibrance treatment; values less than 0.0 indicate that the Clariva Complete Beans treatment mean yield was

numerically less than the CruiserMaxx Advanced plus Vibrance treatment. The color of the bars indicates the type of experiment from which the data were obtained. Bars with an asterisk are experiments in which there was an 80 percent or greater chance that the yield difference was due to a true treatment effect, not random yield variability.

Effects on SCN population densities

- There was a significant reduction in season-long SCN reproduction (comparing beginning- and end-of-season SCN soil population densities) associated with Clariva in small-plot experiments in east central (Urbana) and southeast (Fruitland) Iowa.
- Significant reductions in season-long SCN reproduction also were associated with Clariva when data from three experiments across central Iowa were combined and when data from experiments from across the state were combined for analysis.
- Significantly greater yields did not always occur with Clariva in experiments where significant reductions in season-long SCN reproduction were detected.

Summary

The results of experiments we conducted in 2014 comparing the yields and changes in SCN soil population densities between the two seed treatments were variable. Significant increases in soybean yields and decreases in SCN reproduction in association with Clariva were detected only in some experiments. Additional work is needed to determine the consistency of the differences we detected and the effects of Clariva in additional environments and under different weather conditions. Summaries of all of the ISA On-Farm strip trials that compared Clariva Complete Beans and CruiserMaxx Advanced plus Vibrance in 2014 are [available online](#).

Plans for the future

There are nine additional small-plot experiments comparing these two seed treatments that will be conducted in 2015, and numerous on-farm strip trials also are planned. Contact Tristan Mueller (contact information listed below) if you are interested in conducting a strip trial comparing Clariva Complete Beans versus CruiserMaxx Advanced plus Vibrance in an SCN-infested field in Iowa in 2015.

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This article was published originally on 2/6/2015. The information contained within the article may or may not be up to date depending on when you are accessing the information.

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