1-1-2015

On-Farm Soybean Seed Treatment Trials

Jim Fawcett  
*Iowa State University*, fawcett@iastate.edu

Zack Koopman  
*Iowa State University*, zkoopman@iastate.edu

Lance Miller  
*Iowa State University*, lrm@iastate.edu

Wayne Roush  
*Iowa State University*, wroush@iastate.edu

Josh Sievers  
*Iowa State University*, sieversj@iastate.edu

Follow this and additional works at: [http://lib.dr.iastate.edu/farms_reports](http://lib.dr.iastate.edu/farms_reports)

Part of the [Agricultural Science Commons](http://lib.dr.iastate.edu/farms_reports), [Agriculture Commons](http://lib.dr.iastate.edu/farms_reports), [Agronomy and Crop Sciences Commons](http://lib.dr.iastate.edu/farms_reports), and the [Natural Resources and Conservation Commons](http://lib.dr.iastate.edu/farms_reports)

**Recommended Citation**  
Fawcett, Jim; Koopman, Zack; Miller, Lance; Roush, Wayne; and Sievers, Josh, "On-Farm Soybean Seed Treatment Trials" (2015).  
*Iowa State Research Farm Progress Reports*. 2135.  
[http://lib.dr.iastate.edu/farms_reports/2135](http://lib.dr.iastate.edu/farms_reports/2135)

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
On-Farm Soybean Seed Treatment Trials

Abstract
Seed treatments offer protection from fungi, insects, and nematodes to germinating seeds and developing seedlings. All legumes require the appropriate rhizobium bacteria in the soil in order for nitrogen fixation to occur. Inoculating the seed with an inoculum can insure the crop can take advantage of this nitrogen fixation.

Keywords
Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences | Natural Resources and Conservation
On-Farm Soybean Seed Treatment Trials

RFR-A1436

Jim Fawcett, extension field agronomist (retired)
Zack Koopman, Ag Engr/Agronomy Farm, ag specialist
Lance Miller, Southeast Farm, ag specialist
Wayne Roush, Western Farm, superintendent
Josh Sievers, Northwest Farm, superintendent

Introduction
Seed treatments offer protection from fungi, insects, and nematodes to germinating seeds and developing seedlings. All legumes require the appropriate rhizobium bacteria in the soil in order for nitrogen fixation to occur. Inoculating the seed with an inoculum can insure the crop can take advantage of this nitrogen fixation.

Materials and Methods
In 2014, seven trials (Table 1) examined the use of soybean seed treatments to increase soybean yield. All trials were conducted on-farm by farmer cooperators using the farmers’ equipment. Soybean seed treatments were applied with the planter and were arranged in a randomized complete block design with at least three replications per treatment. Strip size varied from field to field depending on equipment size and the size of the field. All strips were machine harvested for grain yield.

In Trials 1–4, soybeans planted with soybean seed treated with an inoculant was compared with soybeans planted with untreated seed (Table 2). The inoculant was Optimize® from Novozymes in Trial 1, PPST730 from Pioneer Hybrid for Trials 2-3, and First up ST from Helena Chemical Company for Trial 4.

In Trial 5, soybeans with seed treated with Clariva® nematicide were compared with soybeans planted with untreated seed. In Trial 6, soybeans with seed treated with Cruiser Maxx® were compared with soybeans planted with untreated seed. In Trial 7, the seed treatments Clariva Complete® and Cruiser Maxx Advanced® were compared with soybeans planted with untreated seed. Cruiser Maxx® and Cruiser Maxx Advanced® contain an insecticide and two fungicides. Clariva Complete® contains a nematicide, an insecticide, and two fungicides.

Results and Discussion
None of the soybean inoculants resulted in an increase in soybean yield (Table 2). Most research has indicated that grain yield increases are seldom seen when soybean seed is treated with an inoculant unless the field has not been planted to soybeans for at least five years. Fields in Trials 1–3 had a corn-soybean rotation history for several years, so would be less likely to show a benefit to the soybean inoculant. However, Trial 4 was in a field that had been in sod for 20 years, so a yield increase would have been more likely. It has been speculated there is often enough soil blowing from nearby soybean fields into fields without a recent soybean history resulting in the field being “inoculated” with the soybean rhizobium bacteria. This may have been the case in this field.

In Trial 5, there was not a soybean yield increase with the use of Clariva® nematicide, which may indicate there are low levels of nematodes that feed on soybeans in the field. In Trial 6, there was a yield increase of three bushels/acre with the use of the Cruiser Maxx® seed treatment. This yield increase may have been due either to the insecticide or fungicides in the treatment. The soybeans were planted in early May and the cool, wet weather in May would have increased the likelihood of problems with soil-borne fungal diseases, so most or all of the yield benefit
may have been due to protecting the soybeans from seedling diseases. No yield increase was seen with either of the seed treatments in Trial 7 (Table 3). These soybeans were not planted until June, which would have decreased the likelihood of problems with soybean seedling diseases. Although soybean seed treatments can result in yield increases, significant yield increases were only seen in one of the seven trials in 2014 (P = 0.05).

Table 1. Variety, row spacing, planting date, planting population, and previous crop in on-farm seed treatment trials in soybeans in 2014.

<table>
<thead>
<tr>
<th>Exp. no.</th>
<th>Trial</th>
<th>County</th>
<th>Variety</th>
<th>Row spacing (in.)</th>
<th>Planting date</th>
<th>Planting population (seeds/A)</th>
<th>Previous crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>140706</td>
<td>1</td>
<td>Henry</td>
<td>Mycogen 5N342R2</td>
<td>30</td>
<td>5/23/14</td>
<td>155,000</td>
<td>Corn</td>
</tr>
<tr>
<td>140710</td>
<td>2</td>
<td>Washington</td>
<td>Pioneer P34T07R2</td>
<td>30</td>
<td>5/22/14</td>
<td>140,000</td>
<td>Corn</td>
</tr>
<tr>
<td>140716</td>
<td>3</td>
<td>Washington</td>
<td>Pioneer P34T07R2</td>
<td>30</td>
<td>5/23/14</td>
<td>VR 110-130,000</td>
<td>Corn</td>
</tr>
<tr>
<td>140637</td>
<td>4</td>
<td>Cass</td>
<td>2Y283</td>
<td>15</td>
<td>6/15/14</td>
<td>150,000</td>
<td>Sod</td>
</tr>
<tr>
<td>140130</td>
<td>5</td>
<td>Sioux</td>
<td>NKS2251</td>
<td>30</td>
<td>5/15/14</td>
<td>150,000</td>
<td>Corn</td>
</tr>
<tr>
<td>140323</td>
<td>6</td>
<td>Monona</td>
<td>Renze 2889RR</td>
<td>30</td>
<td>5/6/14</td>
<td>139,000</td>
<td>Corn</td>
</tr>
<tr>
<td>140507</td>
<td>7</td>
<td>Story</td>
<td>Asgrow 2433</td>
<td>30</td>
<td>6/6/14</td>
<td>150,000</td>
<td>Corn</td>
</tr>
</tbody>
</table>

Table 2. Yields from on-farm soybean seed treatment with multiple comparison trials in 2014.

<table>
<thead>
<tr>
<th>Exp. no.</th>
<th>Trial</th>
<th>Treatment</th>
<th>Yield (bu/A)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>140706</td>
<td>1</td>
<td>Inoculant</td>
<td>71</td>
<td>0.29</td>
</tr>
<tr>
<td>140710</td>
<td>2</td>
<td>Inoculant</td>
<td>71</td>
<td>0.29</td>
</tr>
<tr>
<td>140716</td>
<td>3</td>
<td>Inoculant</td>
<td>65</td>
<td>0.82</td>
</tr>
<tr>
<td>140637</td>
<td>4</td>
<td>Inoculant</td>
<td>59</td>
<td>0.21</td>
</tr>
<tr>
<td>140130</td>
<td>5</td>
<td>Clariva</td>
<td>60</td>
<td>0.29</td>
</tr>
<tr>
<td>140323</td>
<td>6</td>
<td>Cruiser Maxx</td>
<td>60</td>
<td>0.03</td>
</tr>
</tbody>
</table>

*P-Value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-Value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.

Table 3. Yields from on-farm soybean seed treatment trials in 2014.

<table>
<thead>
<tr>
<th>Exp. no.</th>
<th>Trial</th>
<th>Treatment</th>
<th>Yield (bu/A)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>140507</td>
<td>7</td>
<td>Clariva Complete</td>
<td>52 a</td>
<td>0.62</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cruiser Maxx Advanced</td>
<td>52 a</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Control</td>
<td>53 a</td>
<td></td>
</tr>
</tbody>
</table>

*Values denoted with the same letter are not significantly different at the significance level 0.05.

*P-Value = the calculated probability that the difference in yields can be attributed to the treatments and not other factors. For example, if a trial has a P-Value of 0.10, then we are 90 percent confident the yield differences are in response to treatments. For P = 0.05, we would be 95 percent confident.