

# ANNUAL REPORT

## ISDA MULTI-LOCATION SWEET CORN SEED TREATMENT TRIAL – 2017

### INTRODUCTION

The Seed Treatment Committee of the International Sweet Corn Development Association (ISDA) organizes an annual trial to compare seed treatments for sweet corn planted at locations across the country. In 2017, the committee set up a comparison of 12 seed treatments on two *sh2* sweet corn varieties, Super Sweet Jubilee Plus and Marquette. This report includes the results from the trials conducted at twelve locations.

### METHODS

A non-treated control and 12 seed treatments were evaluated using two sweet corn seed lots: Super Sweet Jubilee Plus (*sh2*) (warm germ. 90.5%, vigor 84%) and Marquette (*sh2*) (warm germ. 97%, vigor 54.5%). All of the seed treatments included mixtures of fungicide products, some included insecticides, and many included nutritive seed enhancement products (Table 1). Seed treatments were entered into the trial by: The McGregor Company; Necternal, LLC; Nufarm Americas, Inc.; Syngenta Crop Protection, LLC; and Wilbur-Ellis Agribusiness. The committee also selected two standard seed treatment mixtures for comparison. Most of the treatments were applied to the seeds at a facility operated by The McGregor Company, but the treatments entered by Syngenta were applied at their facility in Stanton, MN. Sets of the treated seeds were sent to cooperating researchers for planting and evaluation at twelve locations in seven states (ID, IL, MN, NY, OR, WA, and WI). The experimental design at each location varied, but all sites established randomized plots with at least four replications. Planting dates ranged from April to May. Soil samples (0-6 inch depth) were collected at most locations for soil pathogen screening (*Pythium* spp., *Fusarium* spp., and *Rhizoctonia* spp.). Stand counts were recorded for each plot, usually at the 5-6 leaf stage. Weak plant counts and vigor ratings were also recorded at many of the locations. Weak plants were defined as plants that were two or more leaves behind the average seedlings in the plot, and are reported as the % slows, which was calculated by dividing the number of weak plants by the number of emerged plants. An adjusted % stand was calculated by subtracting the number of weak plants from the number of emerged plants. Vigor ratings were on a qualitative visual scale of 1-5 (1=extremely weak, 2=weak, 3=fair, 4=vigorous, 5=very vigorous).

**ANALYSIS:** Individual plots with % stand results that were less than or greater than 1.5 times the interquartile range were considered extreme outliers, and all of the data from those plots was excluded. Results for each variety at each location were subjected to analysis of variance (ANOVA) and a pairwise comparison of treatment means using the Fisher's protected least significant difference method, LSD (P=0.05). The results were pooled across trial locations and analyzed as both of the varieties together, then SS Jubilee trials only, and Marquette trials only. The combined results were analyzed with ANOVA to evaluate treatment effects, and location x treatment interactions. Data were analyzed using ARM 9 and ARM ST 8 software from Gylling Data Management, Inc.

**TABLE 1: 2017 ISCDA Trial Seed Treatments**

| No. | Name       | Treatment  | Active Ingredients  | Rate   |
|-----|------------|--|---|--|
| 1   | Control    | No Treatment   | none  |  |
| 2   | Standard 1 | Dividend Extreme<br>Apron XL LS<br>Maxim 4FS<br>Vitavax 34   | difenoconazole+mefenoxam<br>mefenoxam<br>fludioxonil<br>carboxin  | 2.00 oz/cwt<br>0.38 oz/cwt<br>0.08 oz/cwt<br>3.50 oz/cwt   |
| 3   | Standard 2 | Dividend Extreme<br>Thiram 480DP<br>Captan 4 Flowable<br>Apron XL<br>Vitavax 34                    | difenoconazole+mefenoxam<br>thiram<br>captan<br>mefenoxam<br>carboxin   | 5.00 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.32 oz/cwt<br>4.00 oz/cwt  |
| 4   | McGregor 1 | Rancona 3.8<br>Thiram 480DP<br>Captan 4 Flowable<br>Belmont<br>Vitavax 34                          | ipconazole<br>thiram<br>captan<br>metalaxyl<br>carboxin   | 0.34 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.75 oz/cwt<br>4.00 oz/cwt  |
| 5   | Syngenta 1 | Dividend Extreme<br>Vibrance<br>Maxim 4FS<br>Apron XL<br>Vitavax 34<br>Fortenza<br>Cruiser         | difenoconazole+mefenoxam<br>sedaxane<br>fludioxonil<br>mefenoxam<br>carboxin<br>cyantraniliprole<br>thiamethoxam  | 2.000 oz/cwt<br>0.160 oz/cwt<br>0.080 oz/cwt<br>0.380 oz/cwt<br>3.500 oz/cwt<br>0.125 mg ai/seed<br>0.300 mg ai/seed         |
| 6   | Syngenta 2 | Dividend Extreme<br>Vibrance<br>Maxim Quattro<br><br>Apron XL<br>Vitavax 34<br>Fortenza<br>Cruiser | difenoconazole+mefenoxam<br>sedaxane<br>fludioxonil+mefenoxam+<br>azoxystrobin+thiabendazole<br>mefenoxam<br>carboxin<br>cyantraniliprole<br>thiamethoxam | 2.000 oz/cwt<br>0.160 oz/cwt<br><br>0.064 mg ai/seed<br>0.290 oz/cwt<br>3.500 oz/cwt<br>0.125 mg ai/seed<br>0.300 mg ai/seed |
| 7   | McGregor 2 | Dividend Extreme<br>Thiram 480DP<br>Captan 4 Flowable<br>Apron XL<br>Vitavax 34<br>AgroFuze Zinc   | difenoconazole+mefenoxam<br>captan<br>thiram<br>mefenoxam<br>carboxin<br>zinc oxide   | 5.00 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.32 oz/cwt<br>4.00 oz/cwt<br>12.00 oz/cwt                                      |

**TABLE 1: 2017 ISCDA Trial Seed Treatments continued...**

| No. | Name       | Treatment   | Active Ingredients  | Rate  |
|-----|------------|---|---|---|
| 8   | Necternal  | Dividend Extreme<br>Thiram 480DP<br>Captan 4 Flowable<br>Apron XL<br>Vitavax 34<br>Onset          | difenoconazole+mefenoxam<br>captan<br>thiram<br>mefenoxam<br>carboxin<br>organic acid | 5.00 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.32 oz/cwt<br>4.00 oz/cwt<br>32.00 oz/cwt |
| 9   | Nufarm 1   | Spirato 480 FS<br>Signet 480 FS<br>Sebring 480 FS<br>Sativa 309 FS<br>Senator 600 FS<br>Sembolite | fludioxonil<br>thiram<br>metalaxyl<br>tebuconazole<br>imidicloprid<br>K, Zn, Mn       | 0.08 oz/cwt<br>2.50 oz/cwt<br>0.50 oz/cwt<br>0.74 oz/cwt<br>6.00 oz/cwt<br>0.60 oz/cwt  |
| 10  | Nufarm 2   | Spirato 480 FS<br>Signet 480 FS<br>Sebring 480 FS<br>Sativa 309 FS<br>UP-1503<br>Senator 600 FS   | fludioxonil<br>thiram<br>metalaxyl<br>tebuconazole<br><br>imidicloprid                | 0.08 oz/cwt<br>2.50 oz/cwt<br>0.50 oz/cwt<br>0.74 oz/cwt<br>1.00 oz/cwt<br>6.00 oz/cwt  |
| 11  | McGregor 3 | Thiram 480DP<br>Captan 4 Flowable<br>Belmont<br>Cruiser   | thiram<br>captan<br>metalaxyl<br>thiamethoxam   | 5.00 oz/cwt<br>4.00 oz/cwt<br>0.75 oz/cwt<br>0.25 mg ai/seed                            |
| 12  | WECO 1     | Dividend Extreme<br>Thiram 480DP<br>Captan 4 Flowable<br>Apron XL<br>Vitavax 34<br>StepUp         | difenoconazole+mefenoxam<br>thiram<br>captan<br>mefenoxam<br>carboxin<br>nitrogen     | 5.00 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.32 oz/cwt<br>4.00 oz/cwt<br>2.00 oz/cwt  |
| 13  | WECO 2     | Dividend Extreme<br>Thiram 480DP<br>Captan 4 Flowable<br>Apron XL<br>Vitavax 34<br>StepUp         | difenoconazole+mefenoxam<br>thiram<br>captan<br>mefenoxam<br>carboxin<br>nitrogen     | 5.00 oz/cwt<br>2.50 oz/cwt<br>2.50 oz/cwt<br>0.32 oz/cwt<br>4.00 oz/cwt<br>3.00 oz/cwt  |

## 2017 ISCDA Seed Treatment Committee Chairs

Mike Erickson, Co-Chair, The McGregor Company, Filer, ID

Ron Baker, Co-Chair, HM Clause Inc., Nampa, ID

Carrie Wohleb, Research Coordinator, Washington State University, Moses Lake, WA

| <b>Trial</b> | <b>Locations</b> | <b>Planting Dates</b> | <b>Participating Researchers or Contacts</b>   |
|--------------|------------------|-----------------------|--|
| ID-1         | Nampa, ID        | May 1, 2017           | Justin Minor, Syngenta Seeds Inc., Nampa, ID   |
| ID-2         | Huston, ID       | May 5, 2017           | Marija Topic, Crookham Company, Caldwell, ID   |
| ID-3         | Napa, ID         | May 23, 2017          | Jennifer Torres, HM Clause, Nampa, ID  |
| IL-1         | Tolono, IL       | April 12, 2017        | Eric Brucker, IFSI, Tolono, IL   |
| MN-1         | Stanton, MN      | April 25, 2017        | Justin Minor, Syngenta Seeds Inc., Nampa, ID   |
| NY-1         | Aurora, NY       | May 24, 2017          | Margaret Smith, Cornell University, Ithaca, NY<br>Sherrie Norman, Cornell University, Ithaca, NY |
| OR-1         | Hermiston, OR    | May 11, 2017          | Scott Lukas, Oregon State University,<br>Hermiston, OR   |
| WA-1         | George, WA       | April 21, 2017        | Carrie Wohleb, Washington State University,<br>Moses Lake, WA                                    |
| WA-1         | Pasco, WA        | May 18, 2017          | Carrie Wohleb, Washington State University,<br>Moses Lake, WA                                    |
| WI-1         | DeForest, WI     | May 2, 2017           | Tim Gustafson, Monsanto Vegetable Seeds,<br>DeForest, WI   |
| WI-2         | Plainfield, WI   | May 8, 2017           | Justin Minor, Syngenta Seeds Inc., Nampa, ID   |
| WI-3         | Plover, WI       | May 9, 2017           | Trevor Frank, IFSI, Plover, IL   |

## RESULTS

A summary of the results is provided on page 9 of this report and is followed by tables and charts showing all results.

### RESULTS – SOIL PATHOGEN ASSAYS

Soil samples were assayed for pathogens by Rachel Bomberger of the Washington State University Plant Pest Diagnostic Clinic. *Pythium* and *Fusarium* species were quantified by soil dilution plating on culture media and are reported as the number of colony forming units (CFU) per gram of soil. *Pythium* colonies were subjected to 10 ppm of metalaxyl to determine if they are sensitive to the fungicide. Colonies with unrestricted growth were deemed metalaxyl-resistant. *Rhizoctonia solani* was quantified using a toothpick baiting protocol and plating on a selective growth medium and is reported as the number of toothpicks (out of 10) with *Rhizoctonia* growth and the number of unique growths that formed on the culture medium. The results are shown in Table 2.

Soil samples were submitted from 8 of 12 locations (ID-2, ID-3, IL-1, NY-1, OR-1, WA-1, WA-2, and WI-3). The only of these locations where *Pythium* was not detected was WI-3. The samples collected from NY-1, OR-1 and WA-2 had the most *Pythium*. The *Pythium* collected at ID-3 was deemed sensitive to metalaxyl, but *Pythium* collected at ID-2, IL-1, NY-1, OR-1, WA-1, and WA-2 had unrestricted colony growth at 10 ppm of metalaxyl and was deemed metalaxyl-resistant. This is one of the more alarming findings of this trial, because all of the seed treatments included either metalaxyl or mefenoxam (the isolated active form (R-isomer) of metalaxyl). *Fusarium* was detected at 7 of 8 locations; it was not detected in the WA-1 sample. The samples collected at ID-2, IL-1, and WA-2 had the most *Fusarium*. *Rhizoctonia* was not detected in the samples from ID-2 or NY-1. Soil samples from WA-1 and WA-2 appeared to have the largest quantities of *Rhizoctonia*.

### RESULTS - % STAND

The treatment means for % stand at each location and for both varieties are shown in Tables 3 a-d. Combined treatment means for both varieties are shown in a “BOTH” column for locations where there was no variety x treatment interaction. The % stand results averaged across 12 locations are shown in Table 4. There are also three box and whisker graphs showing the distribution of treatment means for % stand averaged across locations for both varieties, for SS Jubilee Plus only, and for Marquette only (Figures 1-3).

Ten locations had significant treatment effects for % stand with either SS Jubilee Plus or Marquette (ID-1, ID-2, IL-1, MN-1, NY-1, OR-1, WA-1, WI-1, WI-2 and WI-3). The OR-1 and MN-1 locations had the lowest stands. Most of the locations had reasonably small variation in the data sets for % stand (i.e., coefficients of variation (CV) were less than 15%). The location with the most variable % stand results was MN-1. There was a significant location x treatment interaction in the ANOVA for stand results, so the stand results averaged across 12 locations do not represent responses at all locations. This must be considered when comparing treatments in Table 4.

**SUMMARY ACROSS LOCATIONS:** The non-treated control resulted in the lowest % stand when averaged across 12 locations and both varieties (60.4%), and all of the seed treatments significantly improved stands over the control. The standards (Treatments 2 and 3) resulted in similar stands (68.6% and 69.5%) when averaged across locations and varieties. Treatment 6 was the highest ranking treatment for % stand in this comparison (71.4%), though it was not significantly different from

the standards. The lowest ranking treatment for % stand in the summary across locations and varieties was Treatment 8 (67%). This treatment performed similarly to the standards, but had lower stand counts on average compared to Treatments 4, 6, and 11.

**SS JUBILEE PLUS:** Grand means for % stand at the various locations ranged from 26.1% (MN-1) to 74.4% (ID-3), and averaged 60.2%. The ANOVAs indicated significant treatment effects for % stand at 9 of 12 locations planted with SS Jubilee Plus.

The non-treated control resulted in the smallest stand count for SS Jubilee Plus when analyzed across 12 locations (48.4%). Treatment 8 was the lowest ranking seed treatment for % stand in the SS Jubilee Plus plots (57.5%). Treatment 6 had the largest stand count for SS Jubilee Plus plots (65.6%). Treatment 6 had stands that were comparable to Treatment 3 (Standard 2) and several other treatments in the summary across locations, but was an improvement over the non-treated control and Treatments 2 (Standard 1), 5, 8, 9, 10, and 12. Treatment 4 had significantly higher stand counts in the summary for SS Jubilee Plus compared to Treatments 2 and 8. The two standard seed treatments (Treatments 2 and 3) resulted in combined treatment means for % stand of 59.0% and 62.4% respectively; the stand for Treatment 3 was significantly greater than for Treatment 2.

**MARQUETTE:** Grand means for % stand at the various locations ranged from 48.3% (MN-1) to 87.4% (IL-1), and averaged 77.0%. The ANOVAs indicated significant treatment effects for % stand at 5 of 12 locations planted with Marquette.

The non-treated control resulted in the smallest stand count for Marquette when averaged across 12 locations (72.6%). Treatments 8 and 12 were the lowest ranking seed treatment for % stand in the Marquette plots (70.3%), and they were the only treatments that had stands that were similar to the non-treated control in the summary across 12 locations.

## RESULTS - % SLOWS

Weak plant assessments were intended to account for plants that emerged, but probably would not produce useable ears. Table 5 a-d presents the treatment means for % slows at each location for both varieties. Weak plants were not assessed at the ID-2, MN-1, NY-1, WI-1, or WI-2 locations.

Only 1 of 7 locations planted with SS Jubilee Plus and 3 of 7 locations planted with Marquette had significant treatment differences for % slows. All of the locations had a lot of variation within the data sets for % slows, which was indicated by CVs that were all > 15%. SS Jubilee Plus averaged more weak plants than Marquette.

**SS JUBILEE PLUS:** Grand means for % slows at the 7 locations with SS Jubilee Plus ranged from 3.1% (WA-2) to 29.1% (OR-1). Only the WA-1 location had significant treatment differences for % slows with SS Jubilee Plus.

**MARQUETTE:** Grand means for % slows at the 10 locations with Marquette ranged from 0.8% (WA-1) to 9.5% (OR-1). The OR-1, WA-1, and WI-3 locations had significant treatment differences for % slows with Marquette.

## RESULTS - ADJUSTED % STAND

The adjusted % stand in each plot was calculated to account for seeds that did not emerge and seedlings that were weak and not likely to produce usable ears. Table 6 a-d presents the treatment means for adjusted % stand for each treatment at each location for both varieties. Combined treatment

means for both varieties are shown in a “BOTH” column for locations where there was no variety x treatment interaction. The adjusted % stand results averaged across 7 locations are shown in Table 7. The ID-2, MN-1, NY-1, WI-1 and WI-2 locations did not report % slows, so adjusted % stand could not be calculated.

**SUMMARY ACROSS LOCATIONS:** The non-treated control had the lowest adjusted % stand result at most locations, with a 52.9% adjusted stand in the summary across locations and varieties. All of the seed treatments resulted in similar adjusted % stands when averaged (61.1% to 64.8%).

**SS JUBILEE PLUS:** Grand means for adjusted % stand at the 10 locations with SS Jubilee Plus ranged from 24.1% (OR-1) to 65.3% (ID-3), and averaged 50.1%. Accounting for weak plants decreased the grand means for adjusted % stand of SS Jubilee Plus by 1.2% to 17.6% at different locations, and by an average of 10.1% across locations. The only locations that had no significant treatment differences for adjusted % stand with SS Jubilee Plus were ID-3 and WA-2 (not calculated for ID-2, MN-1, NY-1, WI-1, or WI-2).

The non-treated control resulted in the lowest adjusted % stand for SS Jubilee Plus when averaged across 7 locations (36.9%). All of the seed treatments resulted in similar adjusted % stands when averaged for the SS Jubilee Plus plots (47.4% to 53.5%).

**MARQUETTE:** Grand means for adjusted % stand at the 7 locations with Marquette ranged from 52.5% (OR-1) to 84.0% (IL-1), and averaged 74.5%. Accounting for weak plants decreased the grand means for adjusted % stand of Marquette by 0.3% to 4.7% at different locations, and by an average of 2.5% across locations. Four of 7 locations (ID-1, IL-1, OR-1, and WI-3) had significant treatment effects for adjusted stands in the trials with Marquette.

There were no significant differences in the adjusted % stand when Marquette results were averaged across locations.

## RESULTS – VIGOR

The treatment means for vigor at each location for each variety are shown in Table 8 a-d. Combined treatment means for vigor across locations are presented in Table 9. There are also three box and whisker graphs showing the distribution of treatment means for vigor across locations for both varieties combined, for SS Jubilee Plus, and for Marquette (Figures 4-6). The NY-1 location did not report vigor results.

SS Jubilee Plus seedlings were rated as less vigorous than Marquette seedlings at all locations, with grand means for vigor of 3.14 and 4.05 respectively. The ANOVAs for individual locations indicated significant treatment effects for vigor at 5 of 11 locations with SS Jubilee Plus, and 2 of 11 locations with Marquette. There was a significant location x treatment interaction in the ANOVA for vigor results, so the averages across 11 locations do not represent responses at all locations. This must be considered when comparing treatments in Table 9.

**SUMMARY ACROSS LOCATIONS:** The non-treated control plots had the lowest vigor when averaged across 11 locations and both varieties (3.04). The highest ranking treatment for vigor in the summary across locations with both varieties was Treatment 7 (3.75), and the lowest ranking treatment for vigor was Treatment 8 (3.52).

**SS JUBILEE PLUS:** Grand means for vigor at the 11 locations with SS Jubilee Plus ranged from 1.86 (IL-1) to 4.38 (WA-2), and averaged 3.14. Five of 11 locations (ID-1, IL-1, MN-1, OR-1, and WA-1) showed treatment differences for vigor with the SS Jubilee seed lot.

The non-treated control resulted in the lowest vigor rating in the summary across locations for SS Jubilee Plus (2.38). Treatments 6 and 7 resulted in the best vigor ratings in the summary across locations, 3.37 and 3.36 respectively. These ratings were significantly better than those resulting for the non-treated control and Treatment 12 (2.97) in the summary for SS Jubilee Plus locations.

**MARQUETTE:** Grand means for vigor at the 11 locations with Marquette ranged from 3.12 (MN-1) to 4.69 (WA-2), and averaged 4.05. Two of 11 locations (MN-1 and OR-1) had treatment differences for vigor with the Marquette seed lot.

There were no significant differences in the vigor ratings when Marquette results were averaged across locations.

## **RESULTS –TREATMENT COMPARISONS**

Standard 1 vs. Standard 2: Treatments 2 and 3 resulted in similar stand counts in the summary across locations and varieties. Treatment 3 had significantly larger stand counts compared to Treatment 2, but not adjusted stand counts, when averaged across the SS Jubilee Plus trials only.

Standard 2 vs. McGregor 1: The main difference in these treatments was a substitution of Rancona for Dividend Extreme. The summary across locations did not indicate any differences between these treatments. Treatment 4 (with Rancona) resulted in significantly better stands than Treatment 3 on SS Jubilee Plus at the OR-1 and WI-3 locations (and also looked favorable at ID-2 and WA-1), but Treatment 4 had significantly lower stands at IL-1. These results suggest that the ipconazole in Rancona can be an effective substitute for the difenoconazole in Dividend Extreme.

Syngenta 1 vs. Syngenta 2: These treatments compared seed treatment mixtures with Maxim (Treatment 5) vs. Maxim Quattro (Treatment 6). Treatment 6 had significantly larger stand counts compared to Treatment 5, but not adjusted stand counts, when averaged across the SS Jubilee Plus trials. Treatment 6 resulted in significantly better stands than Treatment 5 on SS Jubilee Plus at the ID-2, IL-1, and MN-1 locations.

Nufarm 1 vs. Nufarm 2: Treatments 9 and 10 included the same active ingredients, but Treatment 9 added Sembolite and Treatment 10 added UP-1503. These two treatments performed similarly in most trials.

Standard 2 vs. McGregor 2: Treatment 7 added AgroFuze Zn to Treatment 3. Treatment 15 resulted in higher vigor ratings (not significant at  $P=0.05$ ) compared to Treatment 3 in the summary across locations. This difference was also noted in last year's trials. The stand counts and adjusted stands did not differ in the summaries.

Standard 2 vs. Necternal: Treatment 8 added Onset to Treatment 3. Treatment 8 had significantly lower stands compared to Treatment 3 in the summary across locations for SS Jubilee Plus, but the only location where the stands differed significantly for these treatments was NY-1. This location had a very low stand count for Treatment 8.

Standard 2 vs. WECO 1 and WECO 2: Treatments 12 and 13 added StepUp to Treatment 3. Treatment 13 had a higher rate of StepUp than Treatment 12. These three treatments performed similarly in most trials.

Insecticides: Treatments 5, 6, 9, 10, and 11 included insecticides. There was no indication that insecticides improved or detracted from stands in this year's trial.

Standard 1 and 2 vs. McGregor 3: Treatment 11 had higher rates of thiram and captan compared to the standards and did not include Dividend Extreme or Vitavax. It did include metalaxyl and an insecticide. Treatment 11 performed comparably to the standards.

## RESULTS SUMMARY

- **PATHOGENS:** Assays of soil samples indicated differences in the quantities of three important seed and seedling rotting pathogens (*Pythium*, *Fusarium*, and *Rhizoctonia*) at locations where the trial was conducted. Metalaxyl-resistant *Pythium* were detected at ID-2, IL-1, NY-1, OR-1, WA-1 and WA-2.
- **SS JUBILEE PLUS vs. MARQUETTE:** SS Jubilee Plus resulted in lower stand counts, lower adjusted stand counts, and lower vigor ratings compared to Marquette.
- **% STAND:** The non-treated control resulted in the smallest stand counts in all of the trials that had significant treatment effects. Treatment 6 had the largest stand counts and Treatment 8 had the smallest stands when the results were averaged across locations, and when averaged across SS Jubilee Plus. All of the seed treatments resulted in stands that were similar to stands for the two standards when averaged across locations, but Treatments 4 and 6 tended to have higher stands than Treatment 2 (Standard 1) when applied to SS Jubilee Plus.
- **ADJUSTED % STAND:** Accounting for slows reduced adjusted stand counts for SS Jubilee Plus by an average of 10.1% across locations. They reduced adjusted stand counts for Marquette by 2.5% on average. The non-treated control resulted in the smallest stand counts when averaged across locations and varieties. All of the other treatments had adjusted % stands that were similar to one or both of the standard treatments in the summary.
- **VIGOR:** The non-treated control had lower vigor ratings compared to the other seed treatments in the summary across all locations and for SS Jubilee Plus. The highest ranking treatment for vigor was Treatment 7, though it was only significantly different than the non-treated control and Treatment 8.
- This trial includes several comparisons of seed treatments that substituted products, added products, and/or modified rates of products in the mixtures (see page 8). Many of these comparisons were not discussed in this report beyond some general trends, but the data for each location are presented in the tables. A close inspection of the results should provide useful information to seed treatment formulators and other sweet corn industry personnel.
- For more information about the 2017 ISCDA Seed Treatment Trial, or about participation in future trials contact Carrie Wohleb at [cwohleb@wsu.edu](mailto:cwohleb@wsu.edu) or (509) 754-2011 x.4313.

**TABLE 2. 2017 ISCDA Seed Treatment Trial – Soil Pathogen Assays**

| LOCATION | <i>Pythium</i><br>CFU/g | Metalaxyl-Resistant<br><i>Pythium</i> | <i>Fusarium</i><br>CFU/g | <i>Rhizoctonia</i> |              |
|----------|-------------------------|---------------------------------------|--------------------------|--------------------|--------------|
|          |                         |                                       |                          | # / 10 Toothpicks  | # of Growths |
| ID-2     | 25                      | Yes                                   | 325                      | None               |              |
| ID-3     | 13                      | No                                    | 125                      | 1                  | 1            |
| IL-1     | 50                      | Yes                                   | 300                      | 1                  | 3            |
| NY-1     | 113                     | Yes                                   | 25                       | None               |              |
| OR-1     | 113                     | Yes                                   | 175                      | 1                  | 1            |
| WA-1     | 50                      | Yes                                   | None                     | 3                  | 3            |
| WA-2     | 113                     | Yes                                   | 225                      | 3                  | 5+           |
| WI-3     | None                    | NA                                    | 175                      | 1                  | 3            |

**TABLE 3a. 2017 ISCDA Seed Treatment Trial - % STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>ID-1</b><br><i>May 1, 2017</i> |             | <b>ID-2</b><br><i>May 5, 2017</i> |             |             | <b>ID-3</b><br><i>May 23, 2017</i> |             |
|---------------------|-----------------------------------|-------------|-----------------------------------|-------------|-------------|------------------------------------|-------------|
|                     | SS JUBILEE+                       | MARQUETTE   | SS JUBILEE+                       | MARQUETTE   | BOTH        | SS JUBILEE+                        | MARQUETTE   |
| 1                   | 25.8 d                            | 70.3 d      | 64.8 e                            | 79.9        | 71.3 d      | 75.8                               | 87.0        |
| 2                   | 41.8 c                            | 76.0 bc     | 75.0 bcd                          | 89.5        | 82.3 ab     | 73.5                               | 87.8        |
| 3                   | 54.8 a                            | 77.8 abc    | 73.8 bcd                          | 86.5        | 80.1 bc     | 75.3                               | 80.3        |
| 4                   | 55.3 a                            | 79.3 abc    | 79.3 ab                           | 84.8        | 82.0 ab     | 81.3                               | 82.8        |
| 5                   | 41.5 c                            | 75.6 bcd    | 75.3 bcd                          | 88.5        | 81.9 ab     | 72.0                               | 83.5        |
| 6                   | 45.3 bc                           | 78.0 abc    | 85.3 a                            | 89.2        | 87.0 a      | 76.3                               | 90.3        |
| 7                   | 56.9 a                            | 81.3 ab     | 75.0 bcd                          | 88.5        | 81.8 ab     | 75.3                               | 75.8        |
| 8                   | 55.2 a                            | 81.5 a      | 68.8 de                           | 81.8        | 75.3 cd     | 70.5                               | 85.8        |
| 9                   | 42.8 c                            | 81.5 a      | 71.0 cde                          | 85.0        | 78.0 bc     | 71.5                               | 86.3        |
| 10                  | 41.8 c                            | 75.6 bcd    | 70.5 cde                          | 89.8        | 80.1 bc     | 73.3                               | 90.3        |
| 11                  | 58.0 a                            | 79.0 abc    | 76.3 bc                           | 86.5        | 81.4 b      | 72.3                               | 85.3        |
| 12                  | 52.3 ab                           | 75.3 cd     | 74.3 bcd                          | 86.0        | 80.1 bc     | 75.7                               | 85.8        |
| 13                  | 57.0 a                            | 76.3 abc    | 71.5 cde                          | 86.8        | 79.1 bc     | 75.5                               | 84.3        |
| <b>GRAND MEAN</b>   | <b>48.3</b>                       | <b>77.3</b> | <b>73.9</b>                       | <b>86.4</b> | <b>80.0</b> | <b>74.4</b>                        | <b>85.1</b> |
| ANOVA: TRT          | 0.0001                            | 0.0069      | 0.0003                            | 0.0559      | 0.0226      | 0.2547                             | 0.2478      |
| <i>LSD (P=0.05)</i> | <i>8.74</i>                       | <i>5.32</i> | <i>6.95</i>                       | <i>5.67</i> | <i>5.5</i>  | <i>6.92</i>                        | <i>9.80</i> |
| CV                  | 12.7                              | 4.8         | 6.6                               | 4.6         | 6.9         | 6.5                                | 8.0         |

**TABLE 3b. 2017 ISCDA Seed Treatment Trial - % STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>IL-1</b><br><i>April 12, 2017</i> |             | <b>MN-1</b><br><i>April 25, 2017</i> |             | <b>NY-1</b><br><i>May 24, 2017</i> |             |
|---------------------|--------------------------------------|-------------|--------------------------------------|-------------|------------------------------------|-------------|
|                     | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                        | MARQUETTE   |
| 1                   | 45.8 e                               | 82.8        | 6.0 d                                | 32.8 e      | 64.0 cde                           | 85.4        |
| 2                   | 72.0 ab                              | 92.3        | 30.5 ab                              | 50.3 bc     | 70.0 a-d                           | 85.5        |
| 3                   | 70.8 ab                              | 88.8        | 35.8 a                               | 49.3 bc     | 73.1 ab                            | 89.0        |
| 4                   | 61.3 d                               | 86.9        | 33.5 ab                              | 51.8 abc    | 73.8 ab                            | 86.3        |
| 5                   | 60.8 d                               | 86.5        | 21.0 c                               | 45.3 cd     | 77.3 a                             | 85.8        |
| 6                   | 75.8 a                               | 89.5        | 32.3 ab                              | 51.3 abc    | 76.3 a                             | 87.8        |
| 7                   | 61.5 cd                              | 86.0        | 28.3 abc                             | 49.9 bc     | 72.7 abc                           | 85.0        |
| 8                   | 65.9 bcd                             | 88.3        | 28.0 abc                             | 48.8 bc     | 58.5 e                             | 88.5        |
| 9                   | 70.5 ab                              | 91.8        | 30.8 ab                              | 54.0 ab     | 74.5 ab                            | 89.3        |
| 10                  | 69.3 abc                             | 85.5        | 26.8 bc                              | 58.5 a      | 76.0 ab                            | 89.3        |
| 11                  | 66.0 bcd                             | 87.5        | 18.8 c                               | 52.0 abc    | 68.0 bcd                           | 89.5        |
| 12                  | 67.5 bcd                             | 84.8        | 26.0 bc                              | 40.8 d      | 62.8 de                            | 86.3        |
| 13                  | 66.5 bcd                             | 86.8        | 25.7 bc                              | 45.3 cd     | 69.3 a-d                           | 85.0        |
| <b>GRAND MEAN</b>   | <b>65.6</b>                          | <b>87.4</b> | <b>26.1</b>                          | <b>48.3</b> | <b>70.4</b>                        | <b>87.1</b> |
| ANOVA: TRT          | 0.0001                               | 0.0642      | 0.0001                               | 0.0001      | 0.0005                             | 0.6438      |
| <i>LSD (P=0.05)</i> | <i>7.97</i>                          | <i>5.24</i> | <i>8.78</i>                          | <i>7.89</i> | <i>8.14</i>                        | <i>5.65</i> |
| CV                  | 8.5                                  | 4.2         | 23.0                                 | 11.4        | 8.1                                | 4.5         |

**TABLE 3c. 2017 ISCDA Seed Treatment Trial - % STAND – SS JUBILEE PLUS and MARQUETTE.***Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>OR-1</b><br><i>May 11, 2017</i> |              |             | <b>WA-1</b><br><i>April 21, 2017</i> |             | <b>WA-2</b><br><i>May 18, 2017</i> |             |
|---------------------|------------------------------------|--------------|-------------|--------------------------------------|-------------|------------------------------------|-------------|
|                     | SS JUBILEE+                        | MARQUETTE    | BOTH        | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                        | MARQUETTE   |
| 1                   | 16.5 e                             | 48.3 e       | 32.4 f      | 35.5 g                               | 75.8        | 66.0                               | 80.0        |
| 2                   | 24.3 cde                           | 54.0 cde     | 39.1 def    | 53.3 de                              | 76.0        | 71.9                               | 86.1        |
| 3                   | 21.8 de                            | 50.8 de      | 36.3 ef     | 67.5 ab                              | 78.0        | 70.8                               | 84.3        |
| 4                   | 41.5 ab                            | 61.3 bcd     | 51.4 bc     | 69.8 a                               | 90.7        | 62.0                               | 84.5        |
| 5                   | 51.3 a                             | 73.8 a       | 62.5 a      | 49.5 ef                              | 75.0        | 67.5                               | 83.8        |
| 6                   | 38.5 abc                           | 69.0 ab      | 55.6 ab     | 45.3 f                               | 74.0        | 69.5                               | 79.3        |
| 7                   | 38.3 abc                           | 66.3 abc     | 52.3 bc     | 69.0 a                               | 71.8        | 59.8                               | 78.3        |
| 8                   | 22.3 cde                           | 50.8 de      | 36.5 ef     | 60.8 bc                              | 73.0        | 61.8                               | 84.0        |
| 9                   | 40.3 ab                            | 55.8 cde     | 48.0 bcd    | 51.0 ef                              | 74.8        | 64.3                               | 88.5        |
| 10                  | 31.8 bcd                           | 57.5 b-e     | 44.6 cde    | 59.0 cd                              | 70.8        | 70.8                               | 82.5        |
| 11                  | 41.3 ab                            | 59.8 b-e     | 50.5 bc     | 63.7 abc                             | 76.3        | 66.3                               | 77.3        |
| 12                  | 27.0 b-e                           | 51.5 de      | 39.3 def    | 67.3 ab                              | 77.0        | 68.8                               | 78.8        |
| 13                  | 35.0 bcd                           | 53.5 de      | 44.3 cde    | 63.0 abc                             | 75.8        | 66.0                               | 85.3        |
| <b>GRAND MEAN</b>   | <b>33.0</b>                        | <b>57.2</b>  | <b>45.6</b> | <b>57.8</b>                          | <b>75.8</b> | <b>66.5</b>                        | <b>82.3</b> |
| ANOVA: TRT          | 0.0013                             | 0.0027       | 0.0001      | 0.0001                               | 0.4302      | 0.4943                             | 0.1124      |
| <i>LSD (P=0.05)</i> | <i>15.01</i>                       | <i>12.36</i> | <i>9.5</i>  | <i>7.43</i>                          | <i>11.6</i> | <i>10.37</i>                       | <i>7.60</i> |
| CV                  | 31.8                               | 14.9         | 21.1        | 8.9                                  | 10.7        | 10.8                               | 6.4         |

**TABLE 3d. 2017 ISCDA Seed Treatment Trial - % STAND – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>WI-1</b><br><i>May 2, 2017</i> |             | <b>WI-2</b><br><i>May 8, 2017</i> |             | <b>WI-3</b><br><i>May 9, 2017</i> |             |
|---------------------|-----------------------------------|-------------|-----------------------------------|-------------|-----------------------------------|-------------|
|                     | SS JUBILEE+                       | MARQUETTE   | SS JUBILEE+                       | MARQUETTE   | SS JUBILEE+                       | MARQUETTE   |
| 1                   | 63.0                              | 78.8 ab     | 63.0 bc                           | 77.8        | 74.5 cd                           | 54.3 e      |
| 2                   | 68.5                              | 77.0 abc    | 71.7 ab                           | 82.0        | 83.0 bc                           | 61.3 de     |
| 3                   | 72.0                              | 73.0 a-d    | 69.0 bc                           | 84.0        | 75.8 bcd                          | 67.3 cd     |
| 4                   | 68.7                              | 74.8 a-d    | 66.0 bc                           | 77.8        | 92.8 a                            | 69.0 bcd    |
| 5                   | 71.0                              | 73.8 a-d    | 69.1 abc                          | 85.0        | 72.3 d                            | 71.8 bc     |
| 6                   | 75.8                              | 69.8 cd     | 78.5 a                            | 77.9        | 79.5 bcd                          | 82.5 a      |
| 7                   | 65.3                              | 69.5 cd     | 64.5 bc                           | 85.5        | 81.5 bc                           | 77.6 ab     |
| 8                   | 65.0                              | 68.5 d      | 70.3 ab                           | 84.0        | 76.0 bcd                          | 66.3 cd     |
| 9                   | 77.3                              | 72.0 bcd    | 62.8 bc                           | 85.0        | 77.5 bcd                          | 68.3 bcd    |
| 10                  | 72.3                              | 80.8 a      | 63.5 bc                           | 84.8        | 80.3 bcd                          | 71.5 bc     |
| 11                  | 67.8                              | 79.5 ab     | 69.0 bc                           | 82.0        | 79.3 bcd                          | 69.5 bcd    |
| 12                  | 66.8                              | 81.3 a      | 71.3 ab                           | 79.5        | 83.5 b                            | 73.3 abc    |
| 13                  | 66.3                              | 68.8 cd     | 61.2 c                            | 83.3        | 82.8 bc                           | 74.6 abc    |
| <b>GRAND MEAN</b>   | <b>69.2</b>                       | <b>74.5</b> | <b>67.6</b>                       | <b>82.1</b> | <b>69.9</b>                       | <b>79.9</b> |
| ANOVA: TRT          | 0.0551                            | 0.0246      | 0.0289                            | 0.2080      | 0.0005                            | 0.0120      |
| <i>LSD (P=0.05)</i> | <i>8.64</i>                       | <i>8.41</i> | <i>9.10</i>                       | <i>7.01</i> | <i>8.52</i>                       | <i>9.80</i> |
| CV                  | 8.7                               | 7.9         | 9.3                               | 5.9         | 7.5                               | 9.8         |

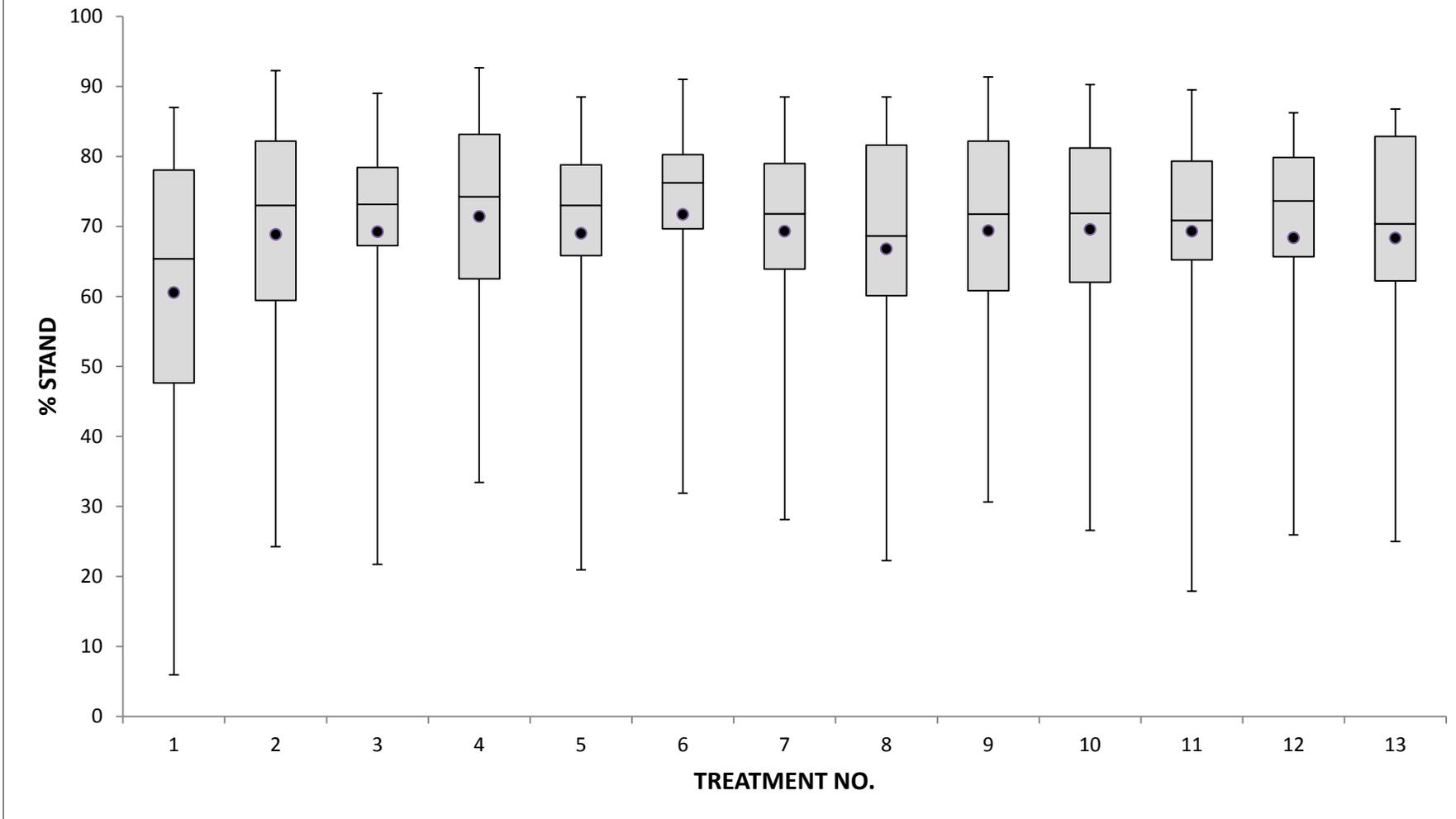
**TABLE 4. 2017 ISCDA Seed Treatment Trial - % STAND – SUMMARY ACROSS LOCATIONS.**

Treatment means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | 12 + 12 LOCATIONS BOTH VARIETIES | 12 LOCATIONS SS JUBILEE+ | 12 LOCATIONS MARQUETTE |
|---------------------|----------------------------------|--------------------------|------------------------|
| 1                   | 60.4 d                           | 48.4 e                   | 72.6 b                 |
| 2                   | 68.6 abc                         | 59.0 cd                  | 78.1 a                 |
| 3                   | 69.5 abc                         | 62.4 abc                 | 76.4 a                 |
| 4                   | 71.0 ab                          | 63.4 ab                  | 78.7 a                 |
| 5                   | 69.2 abc                         | 60.7 bcd                 | 77.4 a                 |
| 6                   | 71.4 a                           | 65.6 a                   | 77.5 a                 |
| 7                   | 69.5 abc                         | 61.4 a-d                 | 77.4 a                 |
| 8                   | 67.0 c                           | 57.5 d                   | 75.9 ab                |
| 9                   | 69.2 abc                         | 60.4 bcd                 | 78.1 a                 |
| 10                  | 69.5 abc                         | 60.5 bcd                 | 79.0 a                 |
| 11                  | 70.0 ab                          | 62.2 a-d                 | 77.7 a                 |
| 12                  | 68.3 bc                          | 60.5 bcd                 | 75.6 ab                |
| 13                  | 69.0 abc                         | 61.4 a-d                 | 76.1 a                 |
| <b>GRAND MEAN</b>   | <b>68.6</b>                      | <b>60.2</b>              | <b>77.0</b>            |
| <i>LSD (P=0.05)</i> | <i>3.0</i>                       | <i>4.7</i>               | <i>3.4</i>             |
| LOCATION            | 0.0001                           | 0.0001                   | 0.0001                 |
| TREATMENT           | 0.0001                           | 0.0001                   | 0.0457                 |
| TRT x LOC           | 0.0001                           | 0.0001                   | 0.0001                 |

## 2017 ISCDA SEED TREATMENT TRIAL - BOTH HYBRIDS

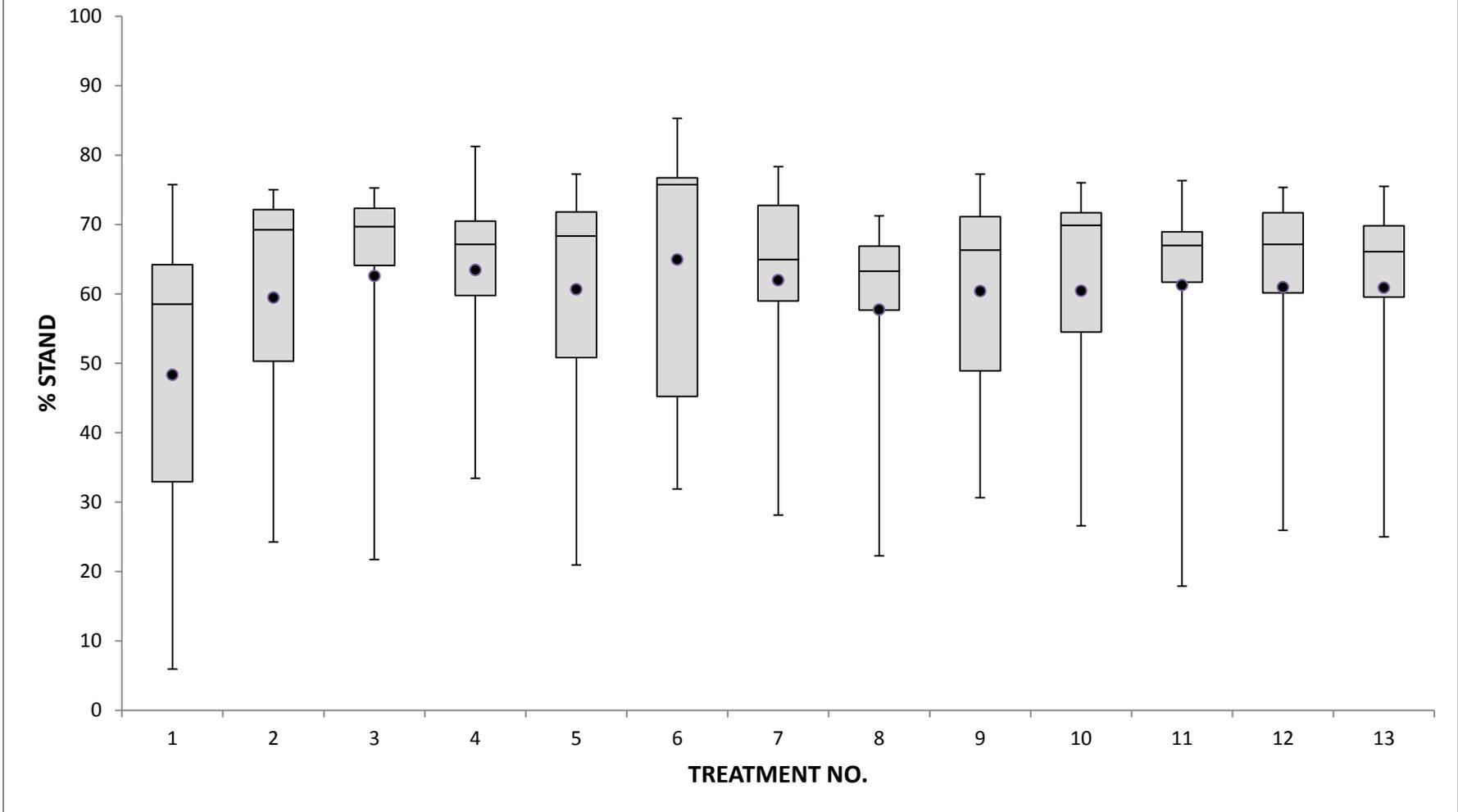
### Combined Treatment Means for % STAND at 12 Locations



**FIGURE 1. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for % STAND for BOTH SWEET CORN VARIETIES at 12 locations.** The mean for each treatment is indicated by • . The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.

## 2017 ISCDA SEED TREATMENT TRIAL - SS JUBILEE PLUS

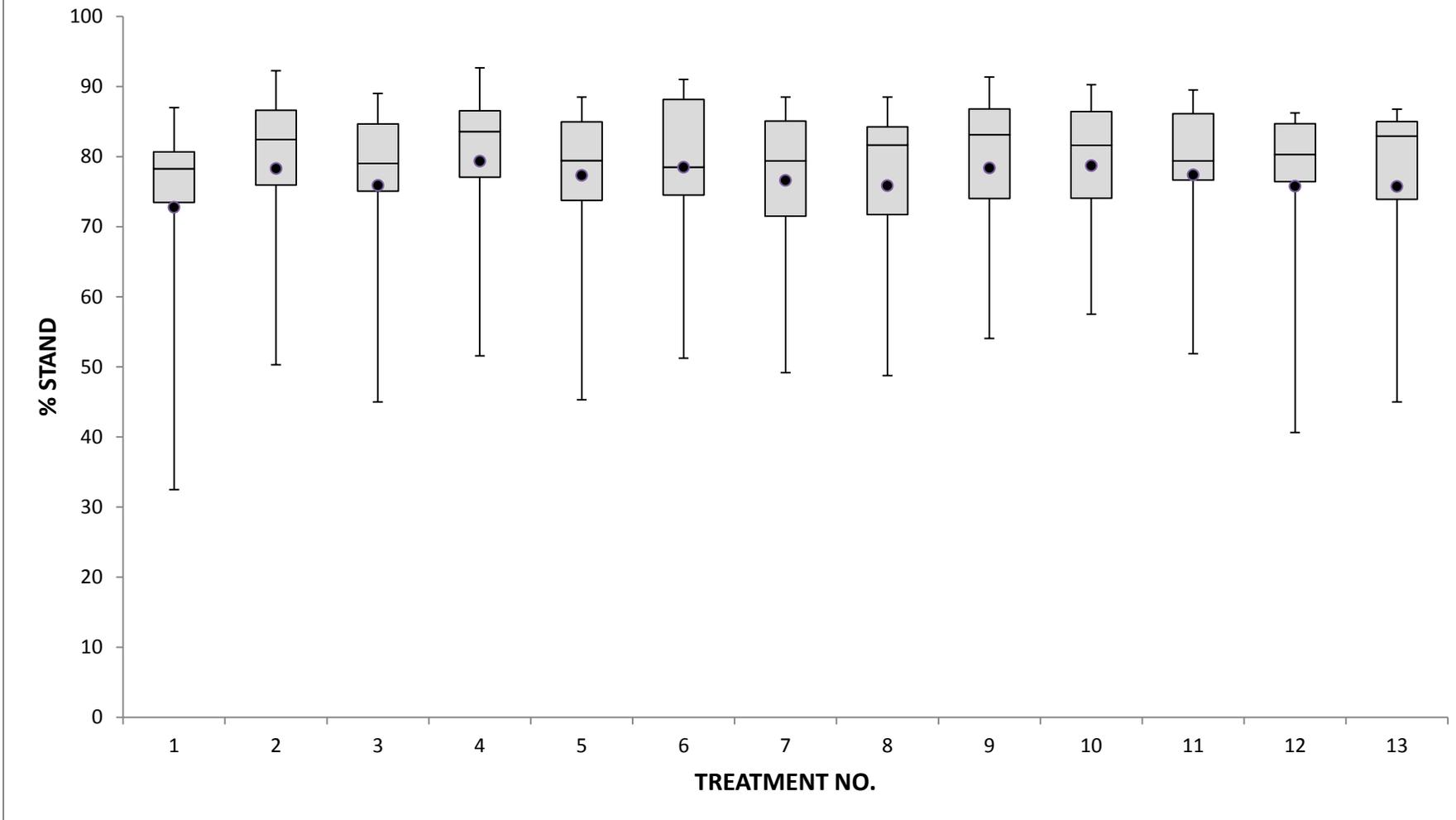
### Combined Treatment Means for % STAND at 12 Locations



**FIGURE 2. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for % STAND for SS JUBILEE PLUS at 12 locations.** The mean for each treatment is indicated by •. The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.

### 2017 ISCDA SEED TREATMENT TRIAL - MARQUETTE

#### Combined Treatment Means for % STAND at 12 Locations



**FIGURE 3. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for % STAND for MARQUETTE at 12 locations.** The mean for each treatment is indicated by •. The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.

**TABLE 5a. 2017 ISCDA Seed Treatment Trial - % SLOWS – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | ID-1<br><i>May 1, 2017</i> |             | ID-2<br><i>May 5, 2017</i> |           | ID-3<br><i>May 23, 2017</i> |             |
|---------------------|----------------------------|-------------|----------------------------|-----------|-----------------------------|-------------|
|                     | SS JUBILEE+                | MARQUETTE   | SS JUBILEE+                | MARQUETTE | SS JUBILEE+                 | MARQUETTE   |
| 1                   | 9.8                        | 6.3         |                            |           | 13.5                        | 6.5         |
| 2                   | 8.5                        | 3.0         |                            |           | 14.3                        | 5.0         |
| 3                   | 8.8                        | 4.5         |                            |           | 11.5                        | 5.3         |
| 4                   | 9.8                        | 6.8         |                            |           | 10.8                        | 6.3         |
| 5                   | 11.0                       | 6.5         |                            |           | 15.8                        | 4.0         |
| 6                   | 9.8                        | 5.8         |                            |           | 17.3                        | 8.2         |
| 7                   | 6.0                        | 2.0         |                            |           | 11.5                        | 6.3         |
| 8                   | 9.8                        | 6.8         |                            |           | 12.5                        | 5.3         |
| 9                   | 10.8                       | 4.8         |                            |           | 11.5                        | 3.0         |
| 10                  | 11.0                       | 4.2         |                            |           | 12.3                        | 5.0         |
| 11                  | 9.5                        | 5.8         |                            |           | 11.0                        | 3.2         |
| 12                  | 13.4                       | 3.0         |                            |           | 8.8                         | 7.5         |
| 13                  | 12.5                       | 6.5         |                            |           | 11.0                        | 6.8         |
| <b>GRAND MEAN</b>   | <b>10.1</b>                | <b>5.1</b>  |                            |           | <b>12.4</b>                 | <b>5.6</b>  |
| ANOVA: TRT          | 0.7914                     | 0.2888      |                            |           | 0.2433                      | 0.5697      |
| <i>LSD (P=0.05)</i> | <i>6.30</i>                | <i>4.11</i> |                            |           | <i>5.41</i>                 | <i>4.52</i> |
| CV                  | 43.3                       | 56.5        |                            |           | 30.2                        | 56.6        |

**TABLE 5b. 2017 ISCDA Seed Treatment Trial - % SLOWS – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>IL-1</b><br><i>April 12, 2017</i> |             | <b>MN-1</b><br><i>April 25, 2017</i> |           | <b>NY-1</b><br><i>May 24, 2017</i> |           |
|---------------------|--------------------------------------|-------------|--------------------------------------|-----------|------------------------------------|-----------|
|                     | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                          | MARQUETTE | SS JUBILEE+                        | MARQUETTE |
| 1                   | 32.5                                 | 5.8         |                                      |           |                                    |           |
| 2                   | 22.0                                 | 2.0         |                                      |           |                                    |           |
| 3                   | 25.3                                 | 3.8         |                                      |           |                                    |           |
| 4                   | 27.0                                 | 3.5         |                                      |           |                                    |           |
| 5                   | 31.0                                 | 5.3         |                                      |           |                                    |           |
| 6                   | 21.0                                 | 4.3         |                                      |           |                                    |           |
| 7                   | 29.3                                 | 2.5         |                                      |           |                                    |           |
| 8                   | 24.0                                 | 5.3         |                                      |           |                                    |           |
| 9                   | 30.5                                 | 3.3         |                                      |           |                                    |           |
| 10                  | 27.0                                 | 4.0         |                                      |           |                                    |           |
| 11                  | 25.0                                 | 3.0         |                                      |           |                                    |           |
| 12                  | 33.3                                 | 5.3         |                                      |           |                                    |           |
| 13                  | 24.8                                 | 3.5         |                                      |           |                                    |           |
| <b>GRAND MEAN</b>   | <b>27.1</b>                          | <b>4.0</b>  |                                      |           |                                    |           |
| ANOVA: TRT          | 0.4327                               | 0.6378      |                                      |           |                                    |           |
| <i>LSD (P=0.05)</i> | <i>11.10</i>                         | <i>3.72</i> |                                      |           |                                    |           |
| CV                  | 28.5                                 | 65.1        |                                      |           |                                    |           |

**TABLE 5c. 2017 ISCDA Seed Treatment Trial - % SLOWS – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>OR-1</b><br><i>May 11, 2017</i> |             | <b>WA-1</b><br><i>April 21, 2017</i> |             | <b>WA-2</b><br><i>May 18, 2017</i> |             |
|---------------------|------------------------------------|-------------|--------------------------------------|-------------|------------------------------------|-------------|
|                     | SS JUBILEE+                        | MARQUETTE   | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                        | MARQUETTE   |
| 1                   | 35.8                               | 20.3 a      | 0.0                                  | 1.0 bc      | 3.8 abc                            | 2.0         |
| 2                   | 41.0                               | 8.5 b       | 3.3                                  | 0.0 c       | 0.2 d                              | 1.0         |
| 3                   | 35.0                               | 7.5 b       | 1.0                                  | 3.3 a       | 4.8 ab                             | 2.0         |
| 4                   | 25.0                               | 9.0 b       | 1.0                                  | 0.2 c       | 2.3 bcd                            | 2.5         |
| 5                   | 19.8                               | 7.3 b       | 2.7                                  | 1.5 abc     | 1.0 cd                             | 1.5         |
| 6                   | 23.6                               | 7.5 b       | 3.0                                  | 1.0 bc      | 5.8 a                              | 1.3         |
| 7                   | 26.3                               | 8.3 b       | 2.5                                  | 0.5 bc      | 4.5 ab                             | 0.3         |
| 8                   | 36.0                               | 10.8 b      | 3.0                                  | 0.3 c       | 3.3 a-d                            | 1.0         |
| 9                   | 22.0                               | 10.0 b      | 3.8                                  | 0.0 c       | 4.3 ab                             | 2.0         |
| 10                  | 30.5                               | 8.0 b       | 2.5                                  | 0.6 bc      | 3.0 a-d                            | 1.3         |
| 11                  | 25.0                               | 6.0 b       | 3.4                                  | 0.0 c       | 2.8 bcd                            | 2.8         |
| 12                  | 31.3                               | 9.3 b       | 2.4                                  | 0.0 c       | 1.3 cd                             | 0.5         |
| 13                  | 26.5                               | 10.8 b      | 2.5                                  | 2.3 ab      | 2.8 bcd                            | 1.0         |
| <b>GRAND MEAN</b>   | <b>29.1</b>                        | <b>9.5</b>  | <b>2.4</b>                           | <b>0.8</b>  | <b>3.1</b>                         | <b>1.5</b>  |
| ANOVA: TRT          | 0.0708                             | 0.0022      | 0.6660                               | 0.0430      | 0.0357                             | 0.4178      |
| <i>LSD (P=0.05)</i> | <i>13.29</i>                       | <i>5.50</i> | <i>3.47</i>                          | <i>1.96</i> | <i>2.94</i>                        | <i>2.08</i> |
| CV                  | 31.8                               | 40.5        | 102.9                                | 162.2       | 65.9                               | 98.4        |

**TABLE 5d. 2017 ISCDA Seed Treatment Trial - % SLOWS – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>WI-1</b><br><i>May 2, 2017</i> |           | <b>WI-2</b><br><i>May 8, 2017</i> |           | <b>WI-3</b><br><i>May 9, 2017</i> |            |
|---------------------|-----------------------------------|-----------|-----------------------------------|-----------|-----------------------------------|------------|
|                     | SS JUBILEE+                       | MARQUETTE | SS JUBILEE+                       | MARQUETTE | SS JUBILEE+                       | MARQUETTE  |
| 1                   |                                   |           |                                   |           | 30.8                              | 8.8 ab     |
| 2                   |                                   |           |                                   |           | 18.3                              | 3.3 c      |
| 3                   |                                   |           |                                   |           | 22.8                              | 2.0 c      |
| 4                   |                                   |           |                                   |           | 27.8                              | 6.1 abc    |
| 5                   |                                   |           |                                   |           | 21.5                              | 9.5 a      |
| 6                   |                                   |           |                                   |           | 12.3                              | 4.5 c      |
| 7                   |                                   |           |                                   |           | 19.8                              | 2.8 c      |
| 8                   |                                   |           |                                   |           | 25.3                              | 4.3 c      |
| 9                   |                                   |           |                                   |           | 32.3                              | 8.5 ab     |
| 10                  |                                   |           |                                   |           | 19.0                              | 3.0 c      |
| 11                  |                                   |           |                                   |           | 20.8                              | 3.3 c      |
| 12                  |                                   |           |                                   |           | 18.4                              | 5.8 abc    |
| 13                  |                                   |           |                                   |           | 27.8                              | 5.3 bc     |
| <b>GRAND MEAN</b>   |                                   |           |                                   |           | <b>22.8</b>                       | <b>5.2</b> |
| ANOVA: TRT          |                                   |           |                                   |           | 0.0709                            | 0.0033     |
| <i>LSD (P=0.05)</i> |                                   |           |                                   |           | 11.6                              | 3.93       |
| CV                  |                                   |           |                                   |           | 35.5                              | 53.5       |

**TABLE 6a. 2017 ISCDA Seed Treatment Trial - % ADJUSTED STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | ID-1<br><i>May 1, 2017</i> |             | ID-2<br><i>May 5, 2017</i> |           | ID-3<br><i>May 23, 2017</i> |              |
|---------------------|----------------------------|-------------|----------------------------|-----------|-----------------------------|--------------|
|                     | SS JUBILEE+                | MARQUETTE   | SS JUBILEE+                | MARQUETTE | SS JUBILEE+                 | MARQUETTE    |
| 1                   | 15.8 e                     | 64.0 c      |                            |           | 65.8                        | 81.3         |
| 2                   | 33.3 d                     | 73.3 ab     |                            |           | 63.3                        | 83.5         |
| 3                   | 46.3 ab                    | 73.3 ab     |                            |           | 66.8                        | 76.0         |
| 4                   | 45.5 ab                    | 72.3 ab     |                            |           | 72.8                        | 77.8         |
| 5                   | 30.5 d                     | 69.4 bc     |                            |           | 60.8                        | 80.3         |
| 6                   | 35.3 cd                    | 71.5 ab     |                            |           | 63.3                        | 83.1         |
| 7                   | 50.6 a                     | 78.5 a      |                            |           | 66.5                        | 71.5         |
| 8                   | 45.4 abc                   | 74.8 ab     |                            |           | 61.8                        | 81.3         |
| 9                   | 32.0 d                     | 76.5 ab     |                            |           | 63.0                        | 83.5         |
| 10                  | 30.5 d                     | 71.4 ab     |                            |           | 64.3                        | 85.8         |
| 11                  | 48.0 ab                    | 73.5 ab     |                            |           | 64.3                        | 82.4         |
| 12                  | 38.9 bcd                   | 71.8 ab     |                            |           | 69.2                        | 79.3         |
| 13                  | 44.5 abc                   | 69.5 bc     |                            |           | 67.3                        | 78.8         |
| <b>GRAND MEAN</b>   | <b>38.2</b>                | <b>72.3</b> |                            |           | <b>65.3</b>                 | <b>80.4</b>  |
| ANOVA: TRT          | 0.0001                     | 0.0233      |                            |           | 0.2404                      | 0.4661       |
| <i>LSD (P=0.05)</i> | <i>9.91</i>                | <i>6.64</i> |                            |           | <i>7.86</i>                 | <i>10.85</i> |
| CV                  | 18.2                       | 6.4         |                            |           | 8.4                         | 9.4          |

**TABLE 6b. 2017 ISCDA Seed Treatment Trial - % ADJUSTED STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.     | <b>IL-1</b><br><i>April 12, 2017</i> |             |             | <b>MN-1</b><br><i>April 25, 2017</i> |           | <b>NY-1</b><br><i>May 24, 2017</i> |           |
|-------------------|--------------------------------------|-------------|-------------|--------------------------------------|-----------|------------------------------------|-----------|
|                   | SS JUBILEE+                          | MARQUETTE   | BOTH        | SS JUBILEE+                          | MARQUETTE | SS JUBILEE+                        | MARQUETTE |
| 1                 | 30.3 e                               | 78.0 d      | 54.1 d      |                                      |           |                                    |           |
| 2                 | 56.0 ab                              | 90.3 a      | 73.1 a      |                                      |           |                                    |           |
| 3                 | 53.0 abc                             | 85.3 abc    | 69.1 abc    |                                      |           |                                    |           |
| 4                 | 45.0 cd                              | 83.7 bcd    | 61.9 c      |                                      |           |                                    |           |
| 5                 | 42.3 d                               | 82.3 bcd    | 62.3 c      |                                      |           |                                    |           |
| 6                 | 60.0 a                               | 85.5 abc    | 72.8 ab     |                                      |           |                                    |           |
| 7                 | 43.5 cd                              | 83.8 bcd    | 63.6 c      |                                      |           |                                    |           |
| 8                 | 50.0 a-d                             | 83.5 bcd    | 69.1 abc    |                                      |           |                                    |           |
| 9                 | 48.8 bcd                             | 88.4 ab     | 65.4 bc     |                                      |           |                                    |           |
| 10                | 50.8 a-d                             | 81.8 cd     | 66.3 abc    |                                      |           |                                    |           |
| 11                | 49.5 a-d                             | 84.8 abc    | 67.1 abc    |                                      |           |                                    |           |
| 12                | 45.3 cd                              | 81.0 cd     | 63.1 c      |                                      |           |                                    |           |
| 13                | 50.0 a-d                             | 83.5 bcd    | 66.8 abc    |                                      |           |                                    |           |
| <b>GRAND MEAN</b> | <b>48.0</b>                          | <b>84.0</b> | <b>65.7</b> |                                      |           |                                    |           |
| ANOVA: TRT        | 0.0009                               | 0.0483      | 0.0219      |                                      |           |                                    |           |
| LSD (P=0.05)      | 10.64                                | 5.97        | 7.7         |                                      |           |                                    |           |
| CV                | 15.4                                 | 5.0         | 11.6        |                                      |           |                                    |           |

**TABLE 6c. 2017 ISCDA Seed Treatment Trial - % ADJUSTED STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.     | <b>OR-1</b><br><i>May 11, 2017</i> |             |             | <b>WA-1</b><br><i>April 21, 2017</i> |             | <b>WA-2</b><br><i>May 18, 2017</i> |             |
|-------------------|------------------------------------|-------------|-------------|--------------------------------------|-------------|------------------------------------|-------------|
|                   | SS JUBILEE+                        | MARQUETTE   | BOTH        | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                        | MARQUETTE   |
| 1                 | 10.3 e                             | 38.3 e      | 24.3 f      | 35.5 e                               | 75.0        | 63.0                               | 78.0        |
| 2                 | 14.3 de                            | 49.5 cde    | 31.9 ef     | 51.3 cd                              | 76.0        | 71.6                               | 84.8        |
| 3                 | 14.0 de                            | 47.0 de     | 30.5 ef     | 67.0 a                               | 75.5        | 66.8                               | 82.3        |
| 4                 | 31.0 abc                           | 55.5 bcd    | 43.3 bc     | 68.8 a                               | 90.5        | 60.2                               | 81.8        |
| 5                 | 41.0 a                             | 68.3 a      | 54.6 a      | 48.5 d                               | 74.0        | 66.5                               | 82.0        |
| 6                 | 29.7 abc                           | 64.3 ab     | 49.1 ab     | 43.8 d                               | 73.5        | 64.8                               | 78.0        |
| 7                 | 28.5 abc                           | 60.5 abc    | 44.5 bc     | 67.5 a                               | 71.3        | 56.5                               | 78.0        |
| 8                 | 14.8 de                            | 45.5 de     | 30.1 ef     | 59.0 bc                              | 72.8        | 59.3                               | 82.8        |
| 9                 | 31.8 ab                            | 50.3 cde    | 41.0 bcd    | 49.0 d                               | 74.8        | 61.3                               | 86.0        |
| 10                | 22.3 b-e                           | 53.0 bcd    | 37.6 cde    | 57.3 bc                              | 70.5        | 68.3                               | 81.0        |
| 11                | 31.0 abc                           | 56.3 a-d    | 43.6 bc     | 61.6 ab                              | 76.3        | 64.0                               | 74.3        |
| 12                | 18.5 cde                           | 46.8 de     | 32.6 def    | 65.6 ab                              | 77.0        | 67.8                               | 78.3        |
| 13                | 26.3 bcd                           | 47.8 de     | 37.0 cde    | 61.3 ab                              | 74.3        | 63.8                               | 84.0        |
| <b>GRAND MEAN</b> | <b>24.1</b>                        | <b>52.5</b> | <b>38.5</b> | <b>56.6</b>                          | <b>75.5</b> | <b>64.1</b>                        | <b>80.9</b> |
| ANOVA: TRT        | 0.0003                             | 0.0011      | 0.7693      | 0.0001                               | 0.4553      | 0.4611                             | 0.1362      |
| LSD (P=0.05)      | 12.53                              | 12.36       | 8.6         | 7.85                                 | 11.77       | 10.80                              | 7.51        |
| CV                | 36.5                               | 16.4        | 22.6        | 9.7                                  | 10.9        | 11.7                               | 6.5         |

**TABLE 6d. 2017 ISCDA Seed Treatment Trial - % ADJUSTED STAND – SS JUBILEE PLUS and MARQUETTE.**  
*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>WI-1</b><br><i>May 2, 2017</i> |           | <b>WI-2</b><br><i>May 8, 2017</i> |           | <b>WI-3</b><br><i>May 9, 2017</i> |             |
|---------------------|-----------------------------------|-----------|-----------------------------------|-----------|-----------------------------------|-------------|
|                     | SS JUBILEE+                       | MARQUETTE | SS JUBILEE+                       | MARQUETTE | SS JUBILEE+                       | MARQUETTE   |
| 1                   |                                   |           |                                   |           | 38.0 e                            | 68.3 cd     |
| 2                   |                                   |           |                                   |           | 50.0 cde                          | 80.0 ab     |
| 3                   |                                   |           |                                   |           | 52.3 bcd                          | 74.3 bcd    |
| 4                   |                                   |           |                                   |           | 50.0 cde                          | 87.1 a      |
| 5                   |                                   |           |                                   |           | 56.5 bcd                          | 65.5 d      |
| 6                   |                                   |           |                                   |           | 72.5 a                            | 76.0 bc     |
| 7                   |                                   |           |                                   |           | 62.3 ab                           | 79.3 ab     |
| 8                   |                                   |           |                                   |           | 49.8 cde                          | 72.8 bcd    |
| 9                   |                                   |           |                                   |           | 46.0 de                           | 71.0 bcd    |
| 10                  |                                   |           |                                   |           | 58.3 bcd                          | 77.8 ab     |
| 11                  |                                   |           |                                   |           | 55.5 bcd                          | 76.8 bc     |
| 12                  |                                   |           |                                   |           | 60.0 abc                          | 78.8 ab     |
| 13                  |                                   |           |                                   |           | 54.0 bcd                          | 78.5 ab     |
| <b>GRAND MEAN</b>   |                                   |           |                                   |           | <b>54.2</b>                       | <b>75.9</b> |
| ANOVA: TRT          |                                   |           |                                   |           | 0.0013                            | 0.0133      |
| <i>LSD (P=0.05)</i> |                                   |           |                                   |           | <i>12.33</i>                      | <i>9.47</i> |
| CV                  |                                   |           |                                   |           | 15.9                              | 8.7         |

**TABLE 7. 2017 ISDA Seed Treatment Trial - % ADJUSTED STAND – SUMMARY ACROSS LOCATIONS.**  
 Treatment means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | 7 + 7 LOCATIONS BOTH VARIETIES | 7 LOCATIONS SS JUBILEE+ | 7 LOCATIONS MARQUETTE |
|---------------------|--------------------------------|-------------------------|-----------------------|
| 1                   | 52.9 b                         | 36.9 b                  | 69.0                  |
| 2                   | 62.0 a                         | 47.6 a                  | 76.5                  |
| 3                   | 62.8 a                         | 52.3 a                  | 73.4                  |
| 4                   | 64.8 a                         | 53.2 a                  | 77.2                  |
| 5                   | 62.1 a                         | 49.5 a                  | 74.7                  |
| 6                   | 64.6 a                         | 53.5 a                  | 75.8                  |
| 7                   | 64.4 a                         | 53.2 a                  | 74.7                  |
| 8                   | 61.5 a                         | 48.8 a                  | 73.3                  |
| 9                   | 61.1 a                         | 47.4 a                  | 75.2                  |
| 10                  | 61.9 a                         | 50.2 a                  | 74.6                  |
| 11                  | 63.9 a                         | 53.0 a                  | 74.7                  |
| 12                  | 63.0 a                         | 51.1 a                  | 73.3                  |
| 13                  | 63.3 a                         | 52.4 a                  | 73.8                  |
| <b>GRAND MEAN</b>   | <b>62.2</b>                    | <b>49.9</b>             | <b>74.3</b>           |
| <i>LSD (P=0.05)</i> | <i>4.4</i>                     | <i>7.2</i>              | <i>4.9</i>            |
| LOCATION            | 0.0001                         | 0.0001                  | 0.0001                |
| TREATMENT           | 0.0001                         | 0.0023                  | 0.2547                |
| TRT x LOC           | 0.0001                         | 0.0001                  | 0.0001                |

**TABLE 8a. 2017 ISCDA Seed Treatment Trial - VIGOR – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | ID-1<br><i>May 1, 2017</i> |              | ID-2<br><i>May 5, 2017</i> |              | ID-3<br><i>May 23, 2017</i> |              |
|---------------------|----------------------------|--------------|----------------------------|--------------|-----------------------------|--------------|
|                     | SS JUBILEE+                | MARQUETTE    | SS JUBILEE+                | MARQUETTE    | SS JUBILEE+                 | MARQUETTE    |
| 1                   | 3.50 b                     | 4.00         | 2.69                       | 4.29         | 2.25                        | 3.88         |
| 2                   | 42.5 a                     | 4.25         | 3.88                       | 4.63         | 2.38                        | 4.00         |
| 3                   | 3.75 ab                    | 4.50         | 4.06                       | 4.69         | 2.63                        | 3.88         |
| 4                   | 4.13 a                     | 4.25         | 3.75                       | 4.50         | 3.00                        | 3.50         |
| 5                   | 3.75 ab                    | 4.04         | 3.50                       | 4.69         | 2.25                        | 4.00         |
| 6                   | 3.75 ab                    | 4.25         | 4.06                       | 4.83         | 2.25                        | 3.85         |
| 7                   | 4.26 a                     | 4.50         | 4.06                       | 4.69         | 2.88                        | 3.50         |
| 8                   | 4.13 a                     | 4.25         | 3.94                       | 4.25         | 2.88                        | 3.38         |
| 9                   | 4.00 ab                    | 4.50         | 3.25                       | 4.56         | 3.13                        | 3.63         |
| 10                  | 3.50 b                     | 4.37         | 3.63                       | 4.69         | 3.13                        | 3.75         |
| 11                  | 4.25 a                     | 4.25         | 4.25                       | 4.44         | 3.00                        | 4.02         |
| 12                  | 3.40 b                     | 4.25         | 3.75                       | 4.56         | 2.65                        | 3.75         |
| 13                  | 4.25 a                     | 3.75         | 3.31                       | 4.81         | 2.88                        | 3.75         |
| <b>GRAND MEAN</b>   | <b>3.92</b>                | <b>4.26</b>  | <b>3.69</b>                | <b>4.59</b>  | <b>2.71</b>                 | <b>3.76</b>  |
| ANOVA: TRT          | 0.0399                     | 0.2007       | 0.3590                     | 0.7156       | 0.1811                      | 0.8757       |
| <i>LSD (P=0.05)</i> | <i>0.576</i>               | <i>0.515</i> | <i>1.152</i>               | <i>0.559</i> | <i>0.793</i>                | <i>0.793</i> |
| CV                  | 10.2                       | 8.4          | 21.7                       | 8.5          | 20.4                        | 14.7         |

**TABLE 8b. 2017 ISCDA Seed Treatment Trial - % VIGOR – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>IL-1</b><br><i>April 12, 2017</i> |             | <b>MN-1</b><br><i>April 25, 2017</i> |              | <b>NY-1</b><br><i>May 24, 2017</i> |           |
|---------------------|--------------------------------------|-------------|--------------------------------------|--------------|------------------------------------|-----------|
|                     | SS JUBILEE+                          | MARQUETTE   | SS JUBILEE+                          | MARQUETTE    | SS JUBILEE+                        | MARQUETTE |
| 1                   | 1.3 d                                | 3.5         | 1.23 c                               | 2.68 d       |                                    |           |
| 2                   | 2.5 ab                               | 3.8         | 1.78 bc                              | 3.15 abc     |                                    |           |
| 3                   | 2.3 abc                              | 3.8         | 2.83 a                               | 3.13 bc      |                                    |           |
| 4                   | 1.5 cd                               | 4.0         | 2.75 a                               | 3.13 bc      |                                    |           |
| 5                   | 1.5 cd                               | 4.0         | 2.30 ab                              | 3.13 bc      |                                    |           |
| 6                   | 3.0 a                                | 3.5         | 2.73 a                               | 3.15 abc     |                                    |           |
| 7                   | 2.0 bcd                              | 4.3         | 2.63 a                               | 3.31 a       |                                    |           |
| 8                   | 1.6 bcd                              | 3.5         | 2.50 ab                              | 3.08 c       |                                    |           |
| 9                   | 2.3 abc                              | 4.4         | 2.53 ab                              | 3.18 abc     |                                    |           |
| 10                  | 2.0 bcd                              | 3.8         | 2.65 a                               | 3.28 ab      |                                    |           |
| 11                  | 1.5 cd                               | 3.8         | 2.15 ab                              | 3.10 c       |                                    |           |
| 12                  | 1.5 cd                               | 4.0         | 2.60 a                               | 3.18 abc     |                                    |           |
| 13                  | 1.3 d                                | 3.8         | 2.21 ab                              | 3.08 c       |                                    |           |
| <b>GRAND MEAN</b>   | <b>1.9</b>                           | <b>3.8</b>  | <b>2.47</b>                          | <b>3.12</b>  |                                    |           |
| ANOVA: TRT          | 0.0083                               | 0.5143      | 0.0101                               | 0.0001       |                                    |           |
| <i>LSD (P=0.05)</i> | <i>0.90</i>                          | <i>0.76</i> | <i>0.783</i>                         | <i>0.172</i> |                                    |           |
| CV                  | 33.7                                 | 13.9        | 23.0                                 | 3.9          |                                    |           |

**TABLE 8c. 2017 ISCDA Seed Treatment Trial – VIGOR – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>OR-1</b><br><i>May 11, 2017</i> |             | <b>WA-1</b><br><i>April 21, 2017</i> |              | <b>WA-2</b><br><i>May 18, 2017</i> |              |
|---------------------|------------------------------------|-------------|--------------------------------------|--------------|------------------------------------|--------------|
|                     | SS JUBILEE+                        | MARQUETTE   | SS JUBILEE+                          | MARQUETTE    | SS JUBILEE+                        | MARQUETTE    |
| 1                   | 2.0 ef                             | 2.0 e       | 2.50 c                               | 4.38         | 4.13                               | 4.63         |
| 2                   | 1.8 f                              | 4.3 abc     | 3.88 ab                              | 4.38         | 4.89                               | 4.69         |
| 3                   | 1.5 f                              | 3.3 d       | 4.38 a                               | 4.88         | 4.13                               | 4.88         |
| 4                   | 4.0 ab                             | 4.5 ab      | 4.25 ab                              | 4.71         | 4.23                               | 4.75         |
| 5                   | 4.3 ab                             | 4.8 a       | 3.47 b                               | 4.50         | 4.63                               | 4.63         |
| 6                   | 3.0 cd                             | 4.8 a       | 3.50 b                               | 4.50         | 4.63                               | 4.63         |
| 7                   | 4.5 a                              | 3.8 bcd     | 4.13 ab                              | 4.38         | 4.13                               | 4.88         |
| 8                   | 2.3 def                            | 3.0 d       | 4.00 ab                              | 4.75         | 4.25                               | 4.50         |
| 9                   | 3.0 cd                             | 3.5 cd      | 3.63 ab                              | 4.63         | 4.25                               | 4.63         |
| 10                  | 3.5 bc                             | 3.5 cd      | 4.00 ab                              | 4.48         | 4.63                               | 4.50         |
| 11                  | 4.0 ab                             | 3.5 cd      | 4.19 ab                              | 4.50         | 4.50                               | 4.63         |
| 12                  | 2.3 def                            | 3.3 d       | 4.19 ab                              | 4.88         | 4.25                               | 4.88         |
| 13                  | 2.8 cde                            | 3.3 d       | 4.38 a                               | 4.63         | 4.25                               | 4.75         |
| <b>GRAND MEAN</b>   | <b>3.0</b>                         | <b>3.7</b>  | <b>3.87</b>                          | <b>4.58</b>  | <b>4.38</b>                        | <b>4.69</b>  |
| ANOVA: TRT          | 0.0001                             | 0.0001      | 0.0027                               | 0.1802       | 0.2555                             | 0.7934       |
| <i>LSD (P=0.05)</i> | <i>0.84</i>                        | <i>0.78</i> | <i>0.805</i>                         | <i>0.411</i> | <i>0.566</i>                       | <i>0.467</i> |
| CV                  | 19.6                               | 15.0        | 14.5                                 | 6.2          | 9.0                                | 6.9          |

**TABLE 8d. 2017 ISCDA Seed Treatment Trial - VIGOR – SS JUBILEE PLUS and MARQUETTE.**

*Planting date in italics.* Means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | <b>WI-1</b><br><i>May 2, 2017</i> |            | <b>WI-2</b><br><i>May 8, 2017</i> |              | <b>WI-3</b><br><i>May 9, 2017</i> |             |
|---------------------|-----------------------------------|------------|-----------------------------------|--------------|-----------------------------------|-------------|
|                     | SS JUBILEE+                       | MARQUETTE  | SS JUBILEE+                       | MARQUETTE    | SS JUBILEE+                       | MARQUETTE   |
| 1                   | 2.0                               | 4.3        | 2.93                              | 3.90         | 1.8                               | 3.5         |
| 2                   | 3.5                               | 4.5        | 3.13                              | 3.95         | 3.0                               | 4.0         |
| 3                   | 2.8                               | 4.5        | 3.08                              | 3.90         | 2.8                               | 4.3         |
| 4                   | 2.7                               | 3.8        | 3.15                              | 3.83         | 2.5                               | 3.6         |
| 5                   | 3.3                               | 4.0        | 3.03                              | 3.95         | 2.5                               | 3.8         |
| 6                   | 4.0                               | 4.0        | 3.08                              | 3.90         | 3.0                               | 3.8         |
| 7                   | 3.0                               | 4.3        | 3.08                              | 3.70         | 2.3                               | 4.0         |
| 8                   | 3.0                               | 4.0        | 3.13                              | 3.95         | 2.0                               | 4.5         |
| 9                   | 3.3                               | 4.0        | 3.08                              | 3.90         | 1.8                               | 3.8         |
| 10                  | 3.5                               | 4.5        | 3.08                              | 3.90         | 2.5                               | 4.5         |
| 11                  | 3.5                               | 4.0        | 3.10                              | 3.90         | 2.3                               | 3.5         |
| 12                  | 2.5                               | 4.3        | 3.10                              | 3.95         | 2.6                               | 4.0         |
| 13                  | 2.8                               | 4.3        | 3.09                              | 3.90         | 3.0                               | 4.3         |
| <b>GRAND MEAN</b>   | <b>3.1</b>                        | <b>4.2</b> | <b>3.09</b>                       | <b>3.90</b>  | <b>2.5</b>                        | <b>4.0</b>  |
| ANOVA: TRT          | 0.2858                            | 0.1166     | 0.2793                            | 0.4160       | 0.2457                            | 0.4780      |
| <i>LSD (P=0.05)</i> | 1.35                              | 0.53       | <i>0.139</i>                      | <i>0.189</i> | <i>1.07</i>                       | <i>0.98</i> |
| CV                  | 30.8                              | 8.8        | 3.1                               | 3.4          | 30.2                              | 17.2        |

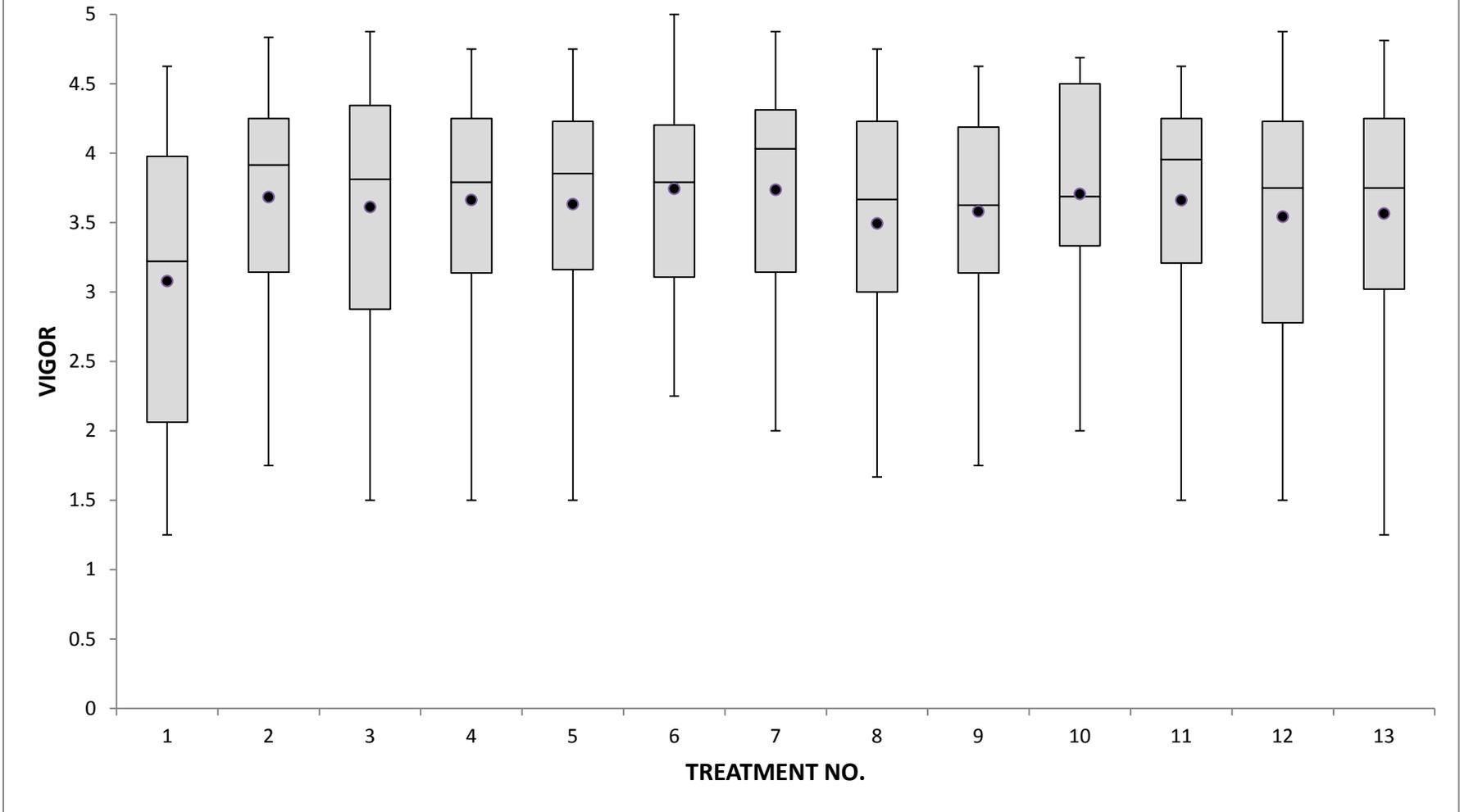
**TABLE 9. 2017 ISCDA Seed Treatment Trial - VIGOR – SUMMARY ACROSS LOCATIONS.**

Treatment means in columns followed by the same letter are not significantly different (P=0.05).

| TREATMENT NO.       | 11 + 11 LOCATIONS BOTH VARIETIES | 11 LOCATIONS SS JUBILEE+ | 11 LOCATIONS MARQUETTE |
|---------------------|----------------------------------|--------------------------|------------------------|
| 1                   | 3.04 c                           | 2.38 c                   | 3.72                   |
| 2                   | 3.63 ab                          | 3.13 ab                  | 4.13                   |
| 3                   | 3.62 ab                          | 3.10 ab                  | 4.14                   |
| 4                   | 3.64 ab                          | 3.26 ab                  | 4.04                   |
| 5                   | 3.63 ab                          | 3.11 ab                  | 4.14                   |
| 6                   | 3.72 ab                          | 3.37 a                   | 4.09                   |
| 7                   | 3.75 a                           | 3.36 a                   | 4.13                   |
| 8                   | 3.52 b                           | 3.08 ab                  | 3.92                   |
| 9                   | 3.57 ab                          | 3.10 ab                  | 4.05                   |
| 10                  | 3.684 ab                         | 3.28 ab                  | 4.1                    |
| 11                  | 3.64 ab                          | 3.31 ab                  | 3.96                   |
| 12                  | 3.55 ab                          | 2.97 b                   | 4.09                   |
| 13                  | 3.56 ab                          | 3.13 ab                  | 4.02                   |
| <b>GRAND MEAN</b>   | <b>3.59</b>                      | <b>3.14</b>              | <b>4.05</b>            |
| <i>LSD (P=0.05)</i> | <i>0.2</i>                       | <i>0.4</i>               | <i>0.2</i>             |
| LOCATION            | 0.0001                           | 0.0001                   | 0.0001                 |
| TREATMENT           | 0.0001                           | 0.0001                   | 0.0636                 |
| TRT x LOC           | 0.0001                           | 0.0001                   | 0.0001                 |

## 2017 ISCDA SEED TREATMENT TRIAL - BOTH HYBRIDS

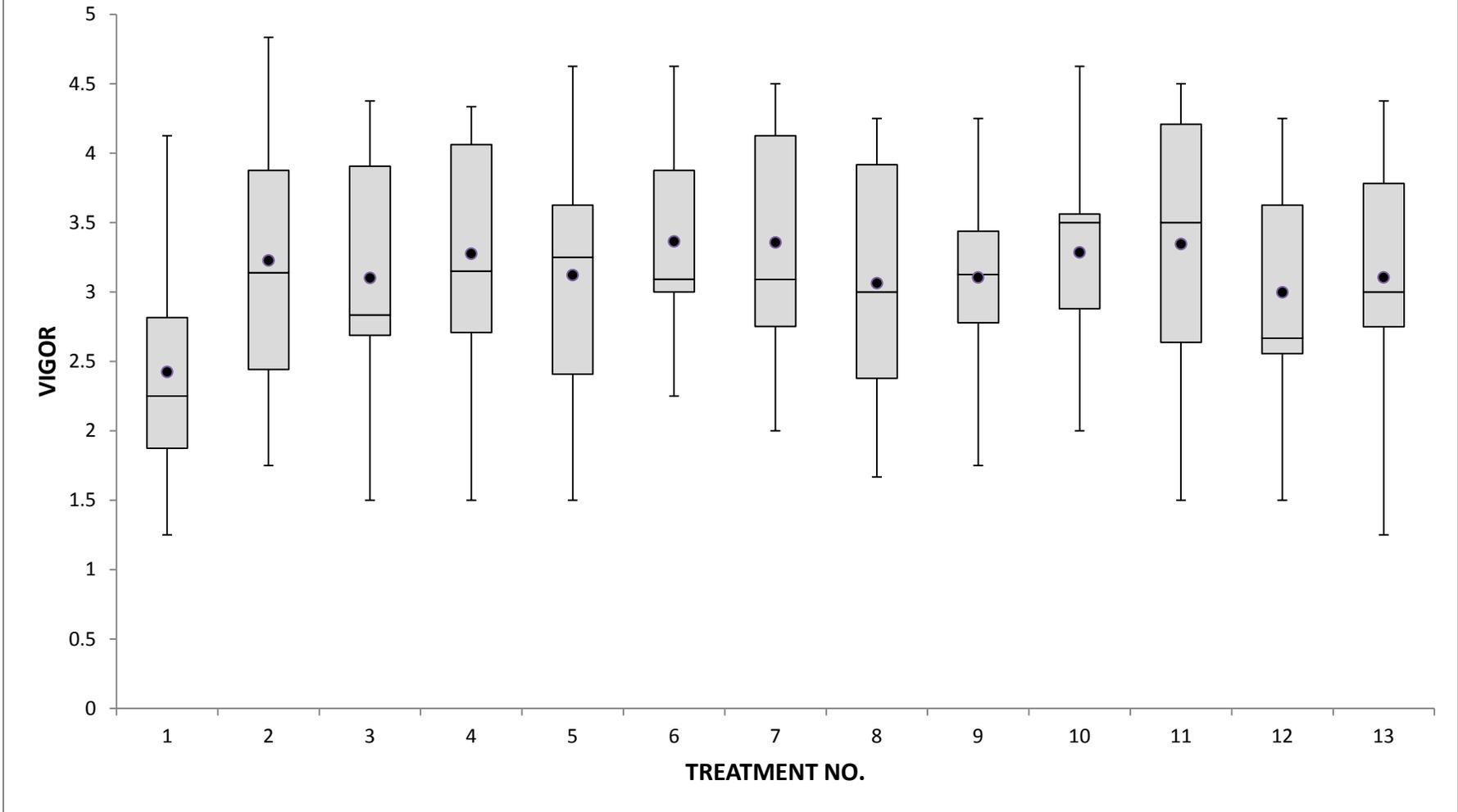
Combined Treatment Means for VIGOR at 11 Locations



**FIGURE 4. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for VIGOR for BOTH SWEET CORN VARIETIES at 11 locations.** The mean for each treatment is indicated by • . The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.

## 2017 ISCDA SEED TREATMENT TRIAL - SS JUBILEE PLUS

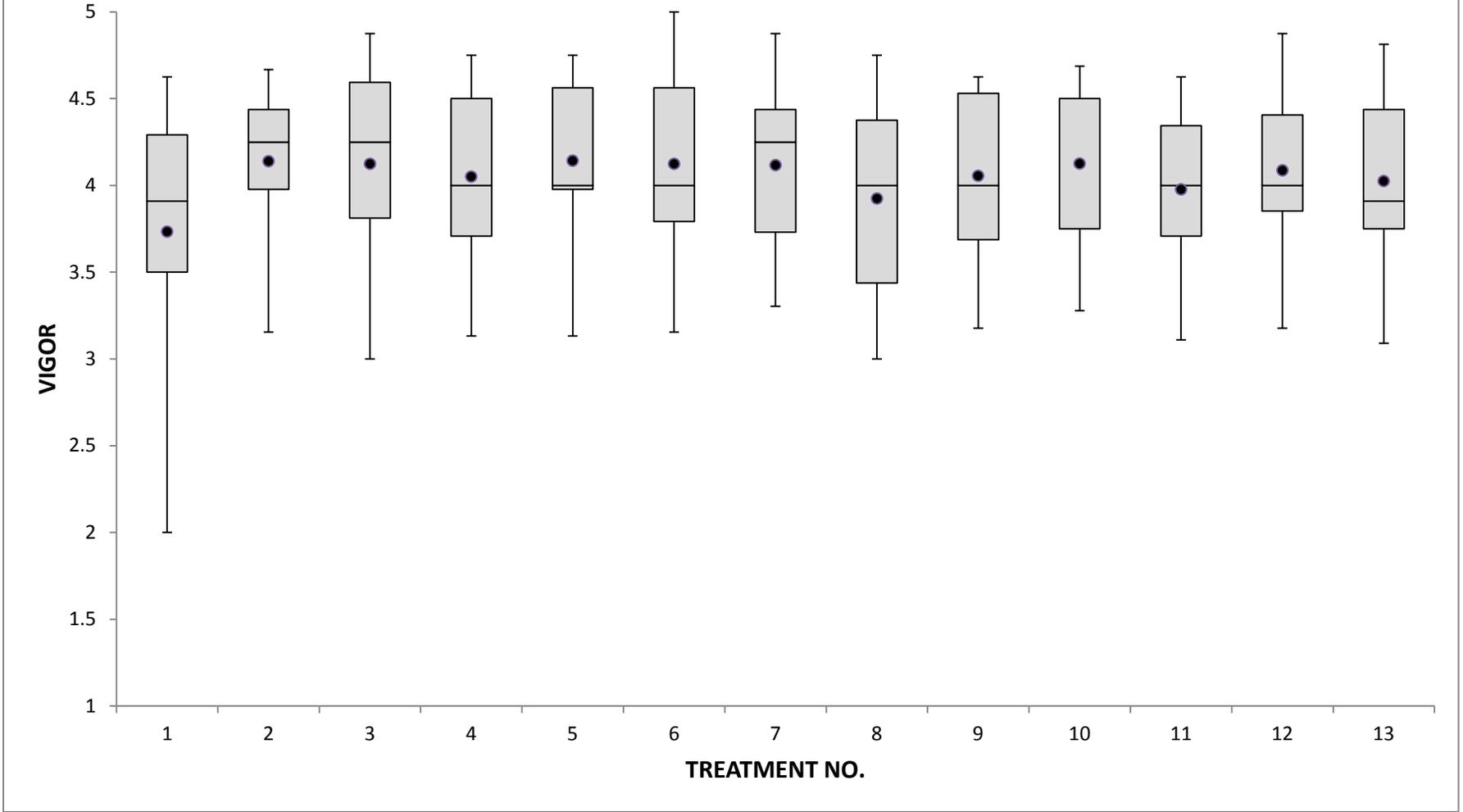
### Combined Treatment Means for VIGOR at 11 Locations



**FIGURE 5. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for VIGOR for SS JUBILEE PLUS at 11 locations.** The mean for each treatment is indicated by •. The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.

### 2017 ISCDA SEED TREATMENT TRIAL - MARQUETTE

#### Combined Treatment Means for % STAND at 11 Locations



**FIGURE 6. 2017 ISCDA Seed Treatment Trial – Box and whisker plot of combined treatment means for VIGOR for MARQUETTE at 11 locations.** The mean for each treatment is indicated by •. The box indicates the interquartile range for results (divided by the median), and the whiskers span to the minimum and maximum results for each treatment.