2007 Pelleted Onion Referee
Region IV -- Southwest

Purpose: This referee was developed in order to test a new media method for pelleted among different laboratories. The ultimate goal was to obtain data to support an AOSA rule proposal adding the "organic media" method as an alternative testing method for pelleted onions.

Introduction:

- An alternative method for testing pelleted onion seed (*Allium cepa*) was developed. The need for a new method arose due to the phytotoxic symptoms that can develop in standard germination tests for pelleted onions that have been treated with certain pesticides, including the insecticide, “Trigard.” The new test method incorporates the use of “organic growing media,” a combination of peat moss and vermiculite, spread over pelleted onion seeds in heavy toweling.

Materials and Methods:

- Three lots of pelleted onions were used in this referee. Lots 1 and 2 were pelleted onions that had been treated with the insecticide, “Trigard.” Lot 3 was a pelleted onion not treated with any insecticide.

- Samples of each lot were sent out to 27 seed laboratories. Participants were asked to test each sample using two methods. The first method was the standard germination method for onions (using towels) listed in the AOSA *Rules*: Substrata T, temperature 20°C, first count 6 days, final count 10 days. The second method was the alternative “organic growing media” method described in the handout.

- Participants were not informed of any treatment or non-treatment with insecticides.

Materials and Methods, cont.

←Example of pelleted onion sprouts planted using the standard germination (T) method, exhibiting phytotoxic symptoms

←Example of the same pelleted onion lot planted using the alternative organic growing media method

Results and Discussion:

- 19 laboratories from across the United States completed the referee and submitted results.
- Data was analyzed using MINITAB statistical software. A General Linear Model ANOVA was used to determine that method differences were significant with ($p<0.5$) 95% confidence. The method differences account for the largest amount of difference; lab and method*lab interactions were also significant.

Figure 1: Mean across all samples/labs comparing two methods

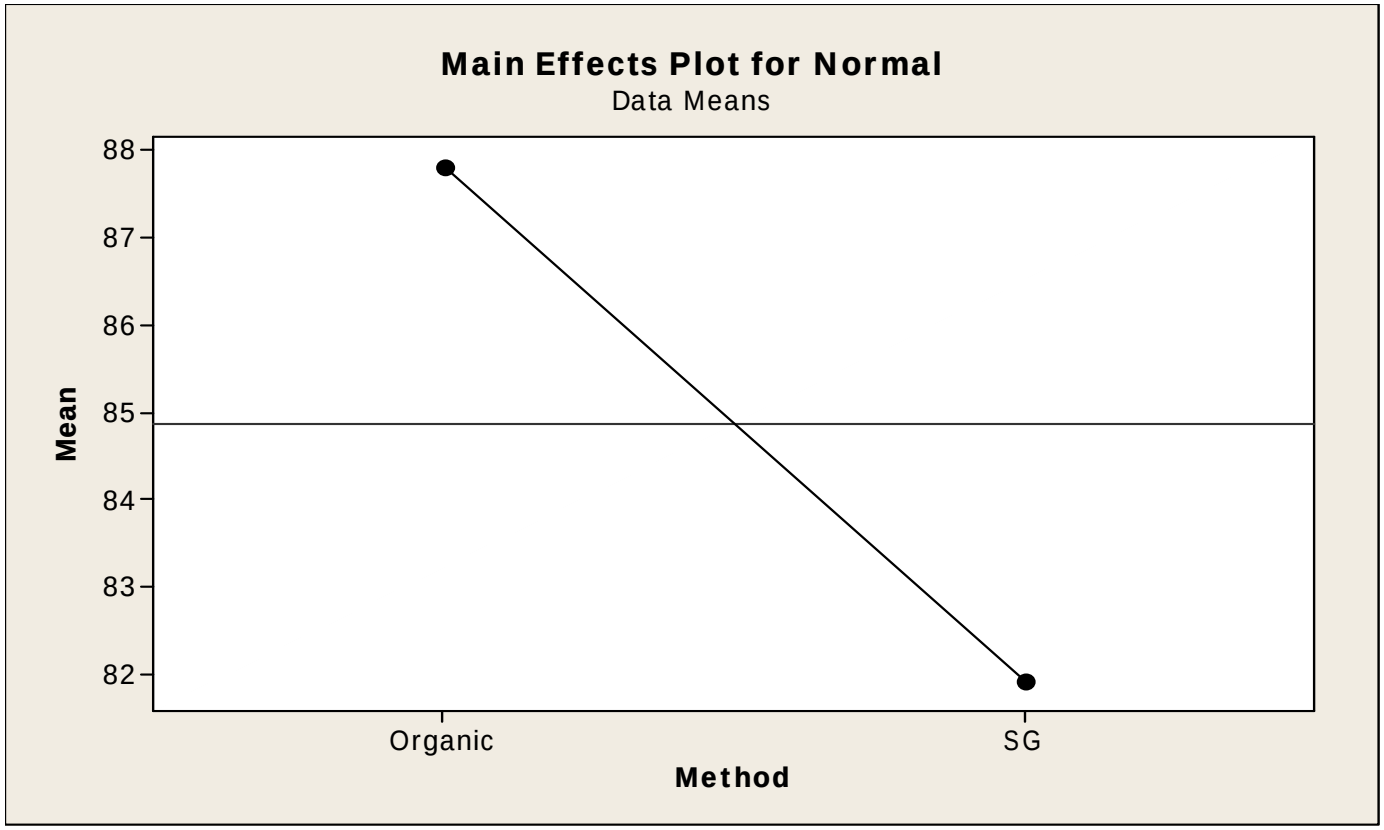


Figure 2: Comparison of Standard Germination and Organic Media Method for Sample 1 (Insecticide-treated)

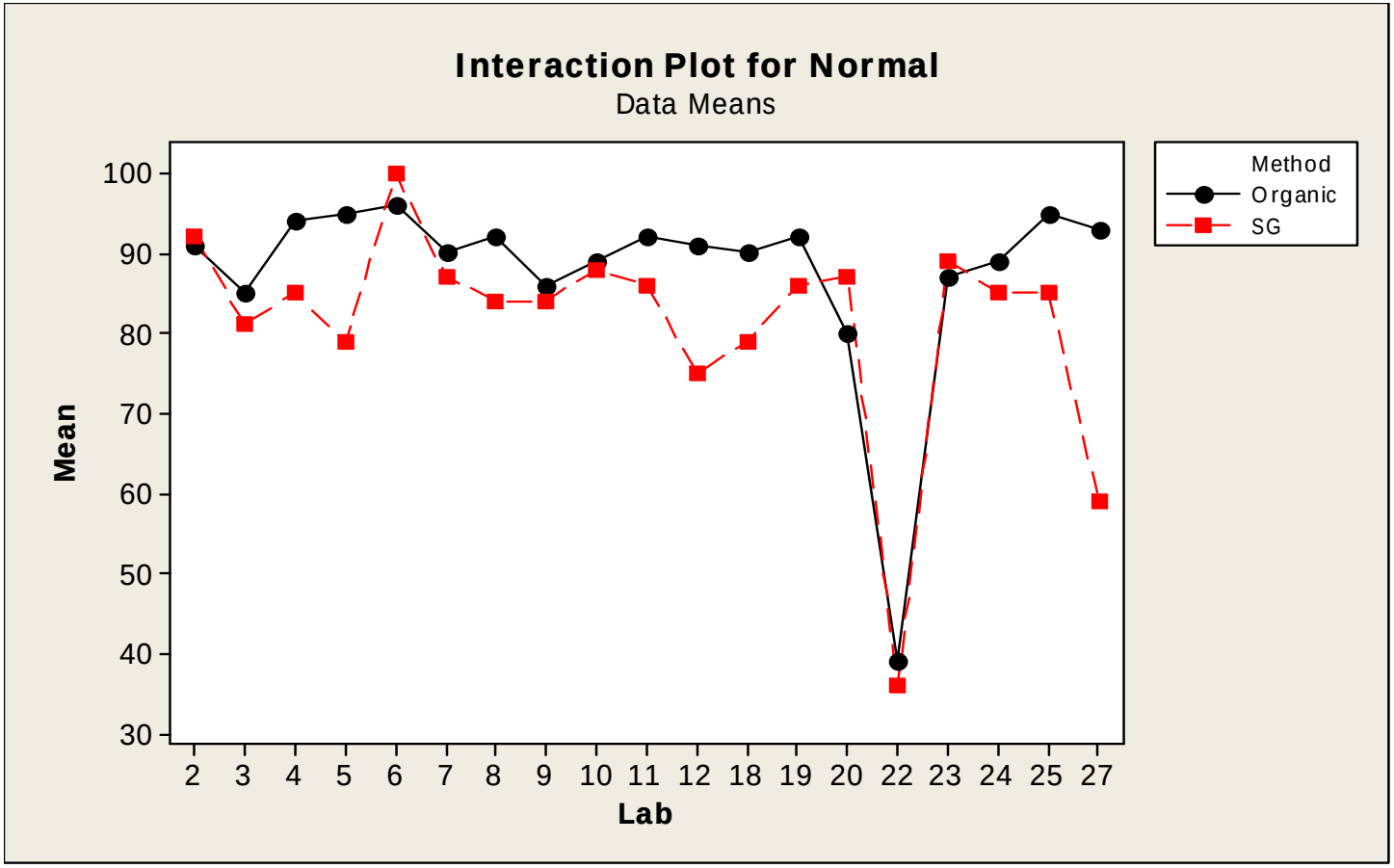


Figure 3: Comparison of Standard Germination and Organic Media Method for Sample 2 (Insecticide-treated)

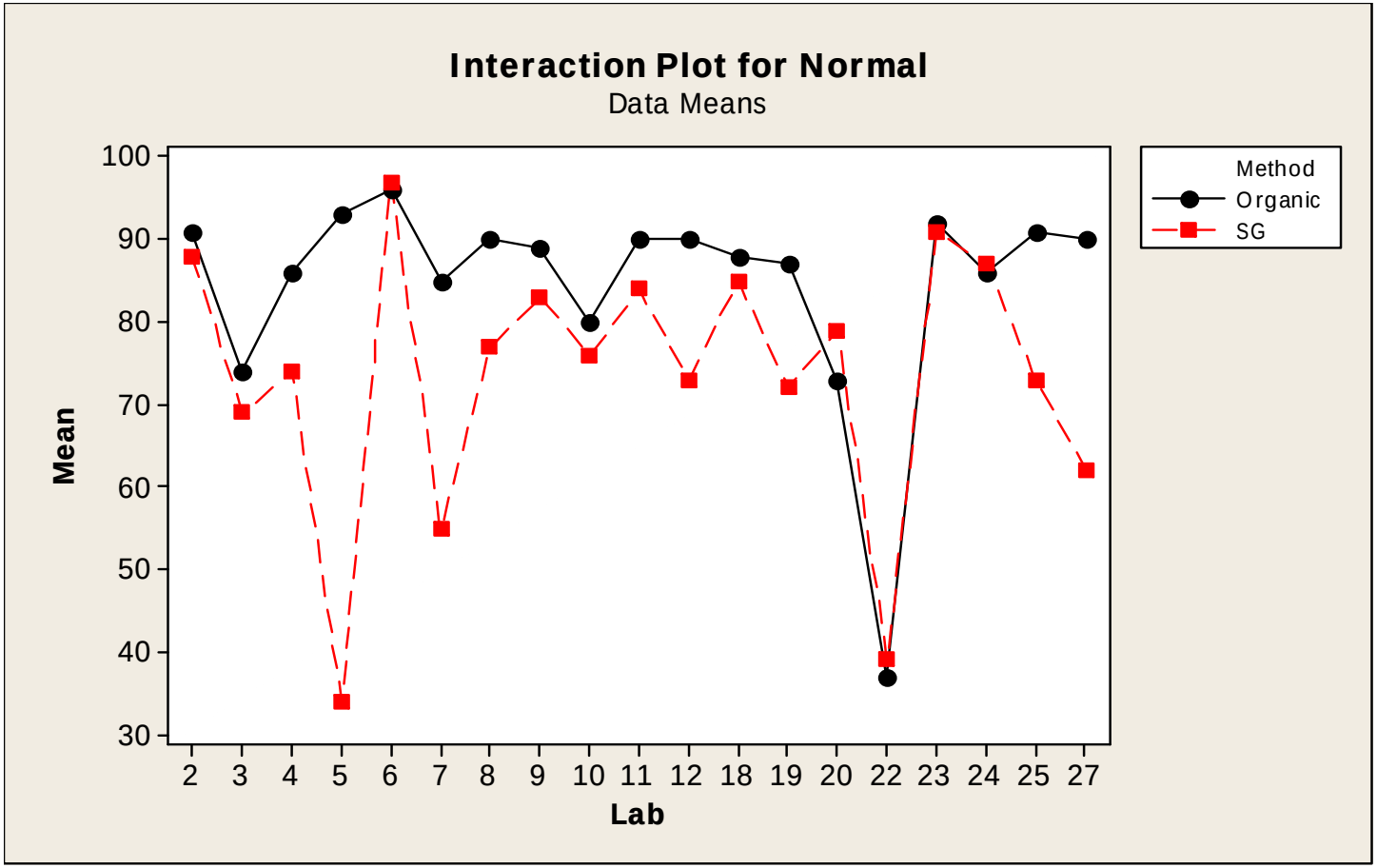
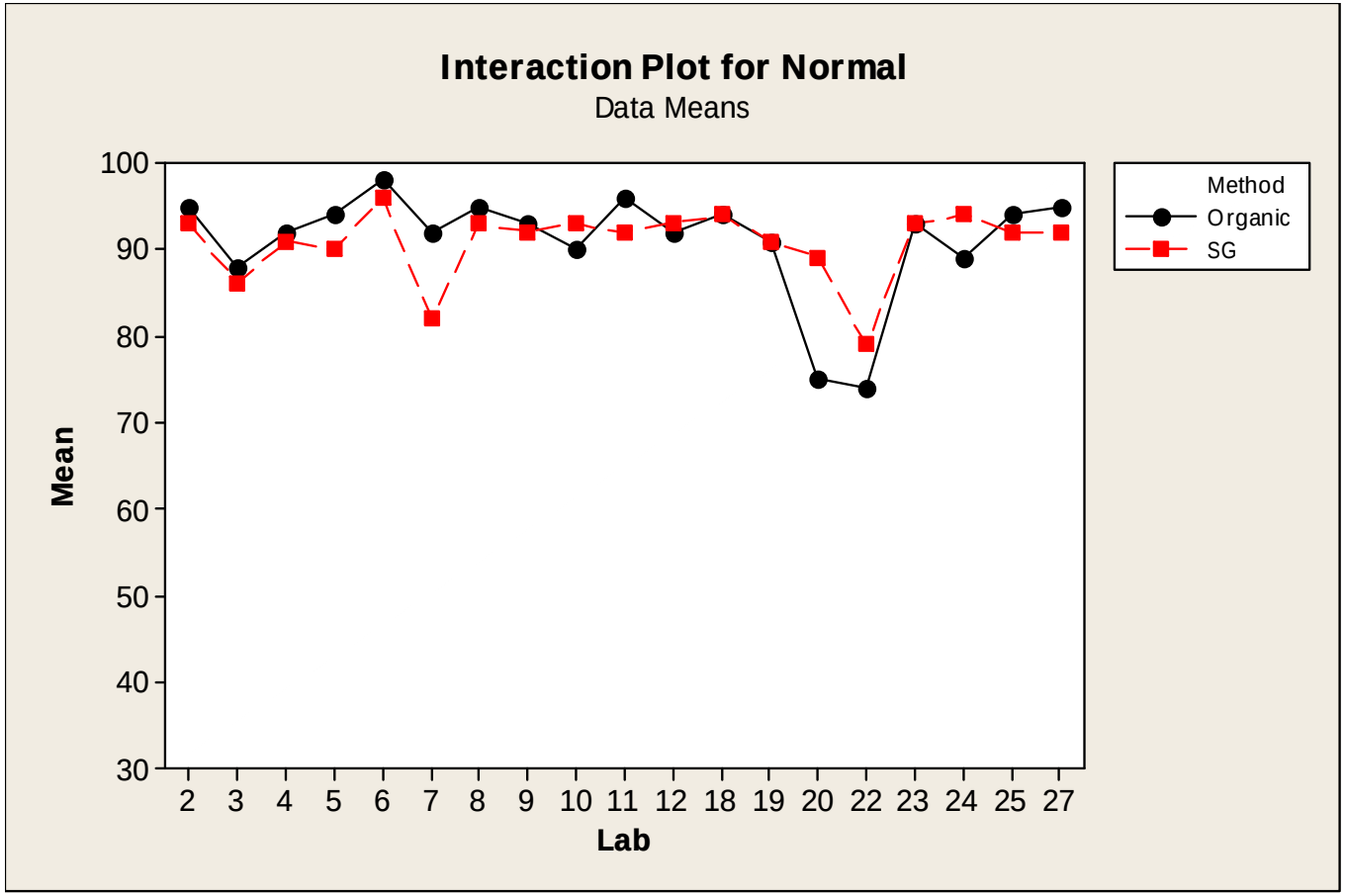


Figure 4: Comparison of Standard Germination and Organic Media Method for Sample 3 (Not insecticide-treated)



Results and Discussion, cont.

- These results are indicative that for pelleted onion samples treated with Trigard (samples 1 and 2), results of standard germination tests across 19 laboratories were widely variable. Results for the same samples tested using the alternative organic growing media method were significantly less variable; in addition, the germination results were significantly higher using the organic growing media method.
- For sample 3 (pelleted onion not treated with any insecticide) variation between methods and between laboratories was much smaller.

Results and Discussion, cont.

- One factor that was not addressed in the protocol used for this referee was the initial moisture content of the peat moss used in the organic media mixture. The fact that the "recipe" was supposed to be based on dry peat moss was inadvertently left out in the referee directions. If the peat moss had absorbed significant moisture from the atmosphere, the mixture would probably be too wet, leading to reduced germination in the organic media method.

Conclusions:

- The results of this referee show that for pelleted onion treated with the insecticide “Trigard” an alternative organic growing media method using a combination of peat moss and vermiculite on towels can reduce the variation in results among laboratories and provide better germination results. In addition, the method provides virtually identical results to standard towel germination testing when pelleted onions are not treated with the insecticide.

Acknowledgements:

- We would like to thank all the participants of this referee. Thanks also to the Cornell laboratory for the initial development of the organic media method, to Incotec for providing the protocol for its use, and to Nunhems and Seminis for providing the seed samples.

Questions?

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