

**2013 AOSA/SCST
Mid-West Region
SORGHUM WARM TEST
REFEREE**

A comparison of the 10 day AOSA
warm test to a 7 day warm test.

Purpose

The purpose of this referee was to determine if the AOSA sorghum warm test procedure can be shortened from 10 days at 20°-30°C to 7 days.

Potential Benefits

- To reduce the turnaround time by 3 days
- To make this test easier to schedule
- To make the samples easier to evaluate, better uniformity within and among labs
- To provide more planting and evaluation days per week

Procedure

- Follow the AOSA Rules for Sorghum bicolor, 20°C-30°C for 10 days. Then use the same method, but substitute 7 days instead of the recommended 10 day test duration.
- Carryover sorghum was used so there would be no need to prechill any of the samples. Ten samples (5 lots duplicated) were sent to each participant.
- This larger set of samples provided more data points to determine uniformity within and among participating laboratories.
- Results will presented at the 2013 AOSA/SCST meeting

Survey Summary

- **18 Laboratories and 21 analysts participated in this referee and answered a short survey (not all participants answered the survey)**
- **How many samples were tested by each lab?**
 - a. 8 labs tested <100 samples/yr
 - b. 1 lab did 101-500 samples/yr
 - c. 4 labs did 501-1000 samples/yr
 - d. 3 labs did >1000 samples/yr

Survey

- **Media?**

- a. All labs used rolled towels.

- b. 7 different dimensions: 9"x15", 9"x22", 10"x15", 10"x 18", 12"x16", 12"x18" and 12"x24"

- c. 13 labs used 38# paper

- d. 2 labs used 76# paper

- e. 1-3 sheets were used per rep

- **Light?**

- a. 9 labs used light

- b. 5 labs did not

- **4-day counts?**

- a. 8 labs did 4 day counts

- b. 8 labs did not

Survey

- **What % of tests were finalized early?**
 - a. 3 labs finalized tests 10% of the time
 - b. 1 lab finalized tests 25-50% of the time
 - c. 12 labs finalized tests > 50% of the time
- **What temperature was used?**
 - a. 15 labs used 20°-30°C
 - b. 1 lab used 25°C
- **Does your lab test for swollen/dormant seed?**
 - a. 4 labs did TZ tests
 - b. 12 labs did not test swollen seed
- **Is there interest in the development of a new cold test procedure?**
 - a. 14 Labs are interested, 2 labs are not

Paired T-Test and CI: 7 day score, 10 day score all labs all entries

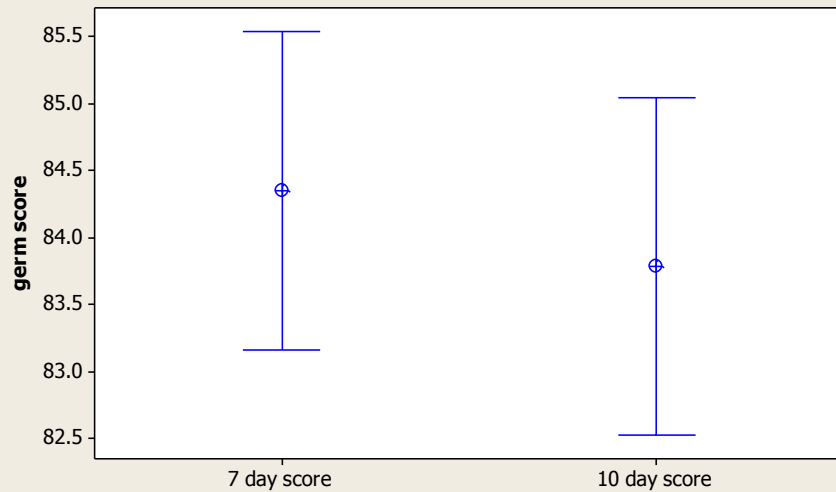
Paired T for 7 day score - 10 day score

	N	Mean	StDev	SE Mean
7 day score	200	84.346	8.497	0.601
10 day score	200	83.785	9.000	0.636
Difference	200	0.561	3.446	0.244

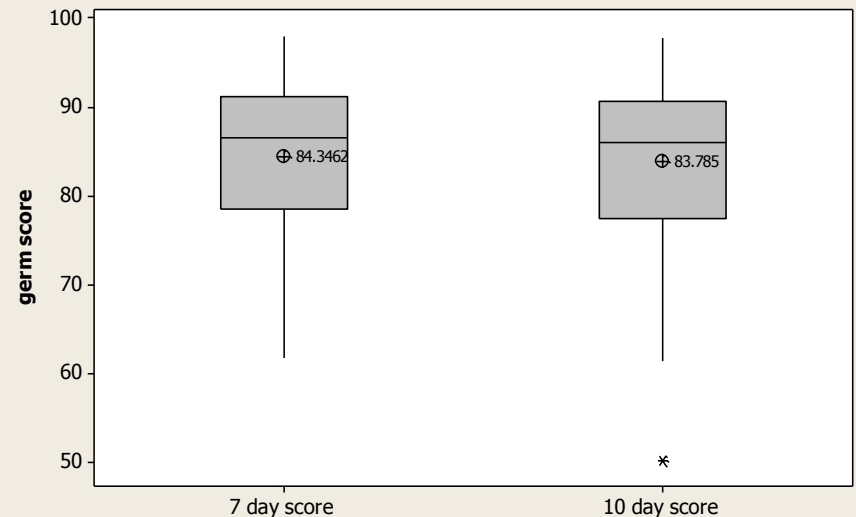
95% CI for mean difference: (0.081, 1.042)

T-Test of mean difference = 0 (vs not = 0): T-Value = 2.30 P-Value = 0.022

Interval Plot of 7 day score, 10 day score all labs all entries
95% CI for the Mean

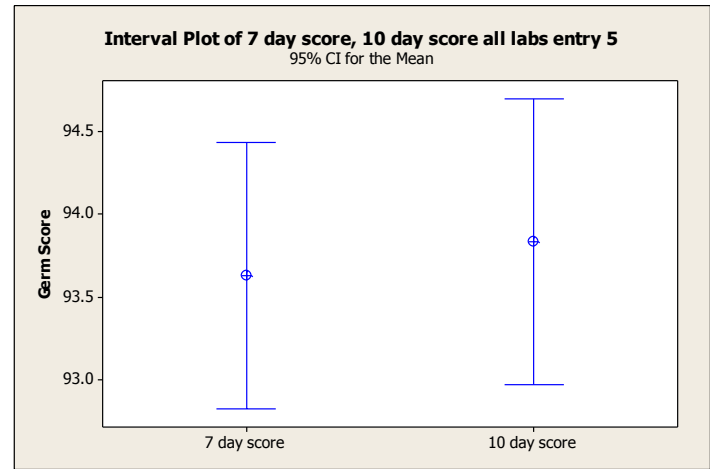
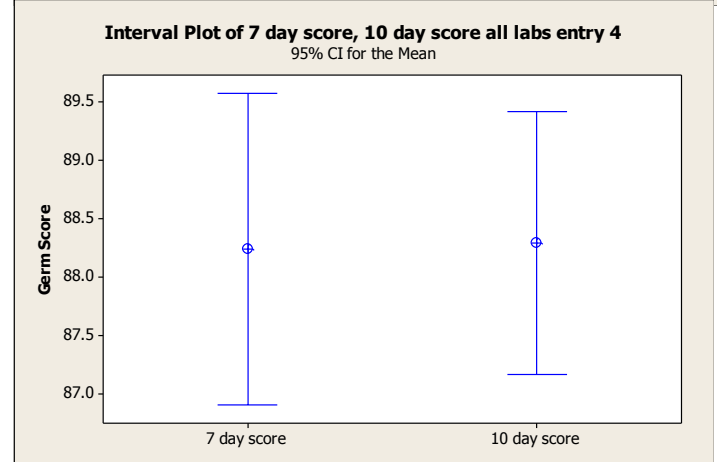
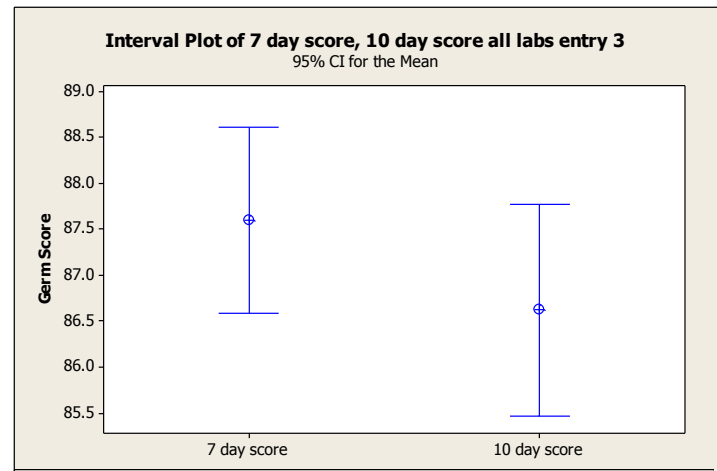
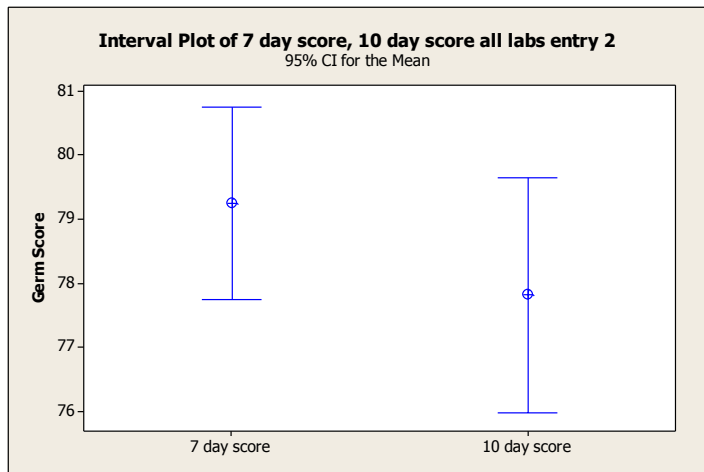
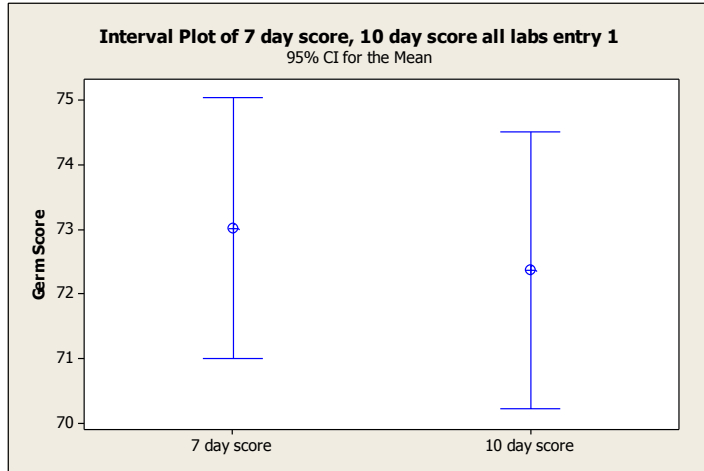


Boxplot of 7 day score, 10 day score all labs all entries

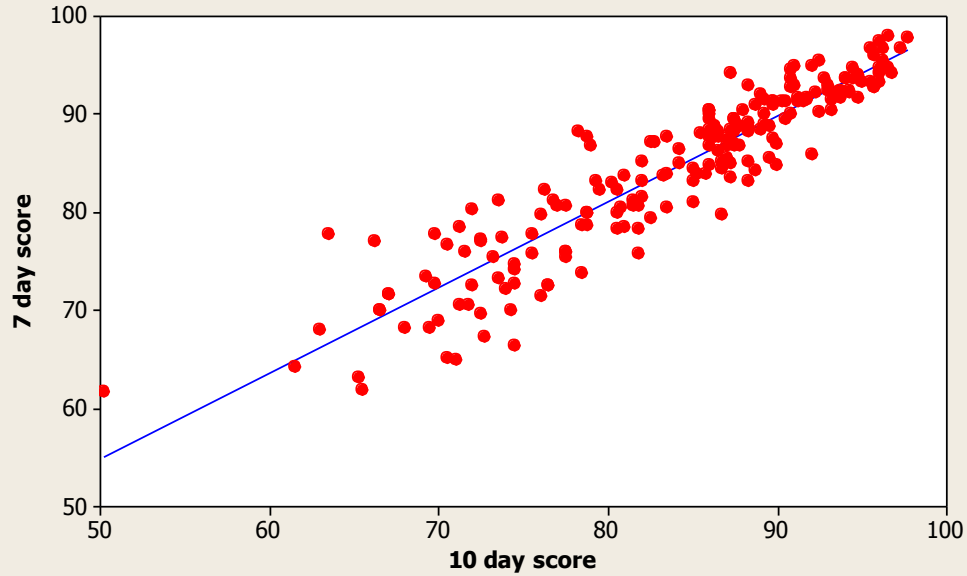


Comparison of 5 seed lots in the 7 and 10 day tests

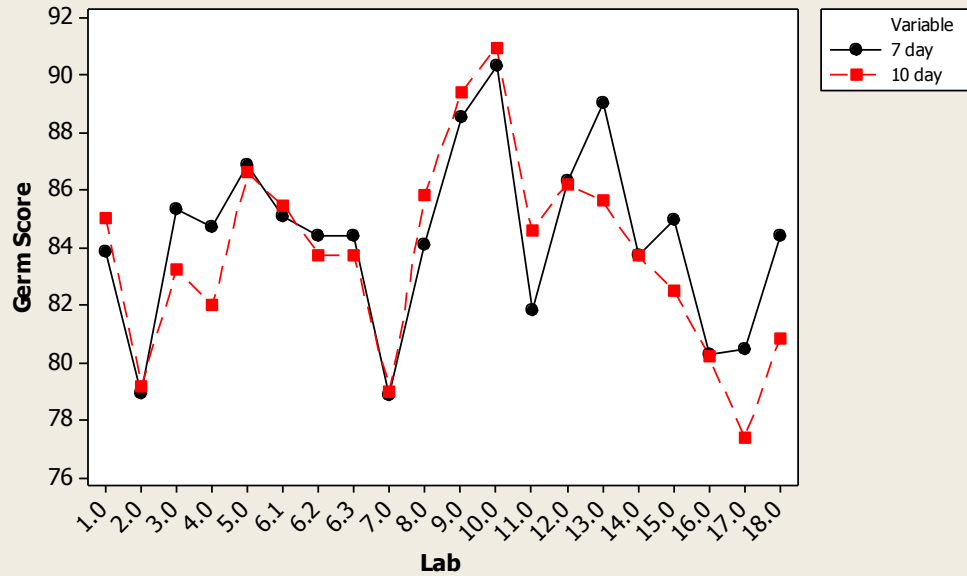
*Note the difference in GermScore scales



Scatterplot of 7 day score vs 10 day score all labs all entries



Overall entry average by test by lab



Discussion

- The 18 participating labs provided a good cross section of regulatory and commercial seed testing laboratories to compare the 7 and 10 test durations for the sorghum warm test.
- Test durations proved to be statistically equivalent.
- 75% of the labs finalize their tests early as a routine, which is not the intention of the current recommended procedure.
- If the procedure was changed to 7 day test duration and a problem exists with a sample the test can all ways be extended to 10 days.
- There seemed to be a slight edge for optimum results for the 7 day test when it comes to testing lower quality seed where disease may interfere with the final evaluations.
- It was interesting to see how many different sizes of towels were used, especially the larger sizes 12"x16", 12"x18" and 12"x 24" given the small seed size of sorghum. The majority of the labs used 38# paper.

Conclusions

- The 7 day and 10 day warm test results are nearly equivalent
- 75% of samples currently tested are being finalized before the end of a 10 day test
- Poor quality samples have their optimum germination prior to the 10 day evaluation
- 75% of the labs did not TZ samples to check for dormancy on carryover seed lots

Recommendations

- Based on the referee data a rule change can be proposed to shorten the current 10 day sorghum warm test to a 7 day duration.
 - a. This would provide a 3 day quicker turnaround on data
 - b. Make the tests easier to schedule
 - c. Tests can be planted and evaluated everyday
 - d. Replications should be easier to evaluate providing more uniform data
 - e. New crop seed would still need to pre-chilled