MID WEST CORN REFEREE

Leaf less than half the length of the coleoptile, abnormality or test condition?

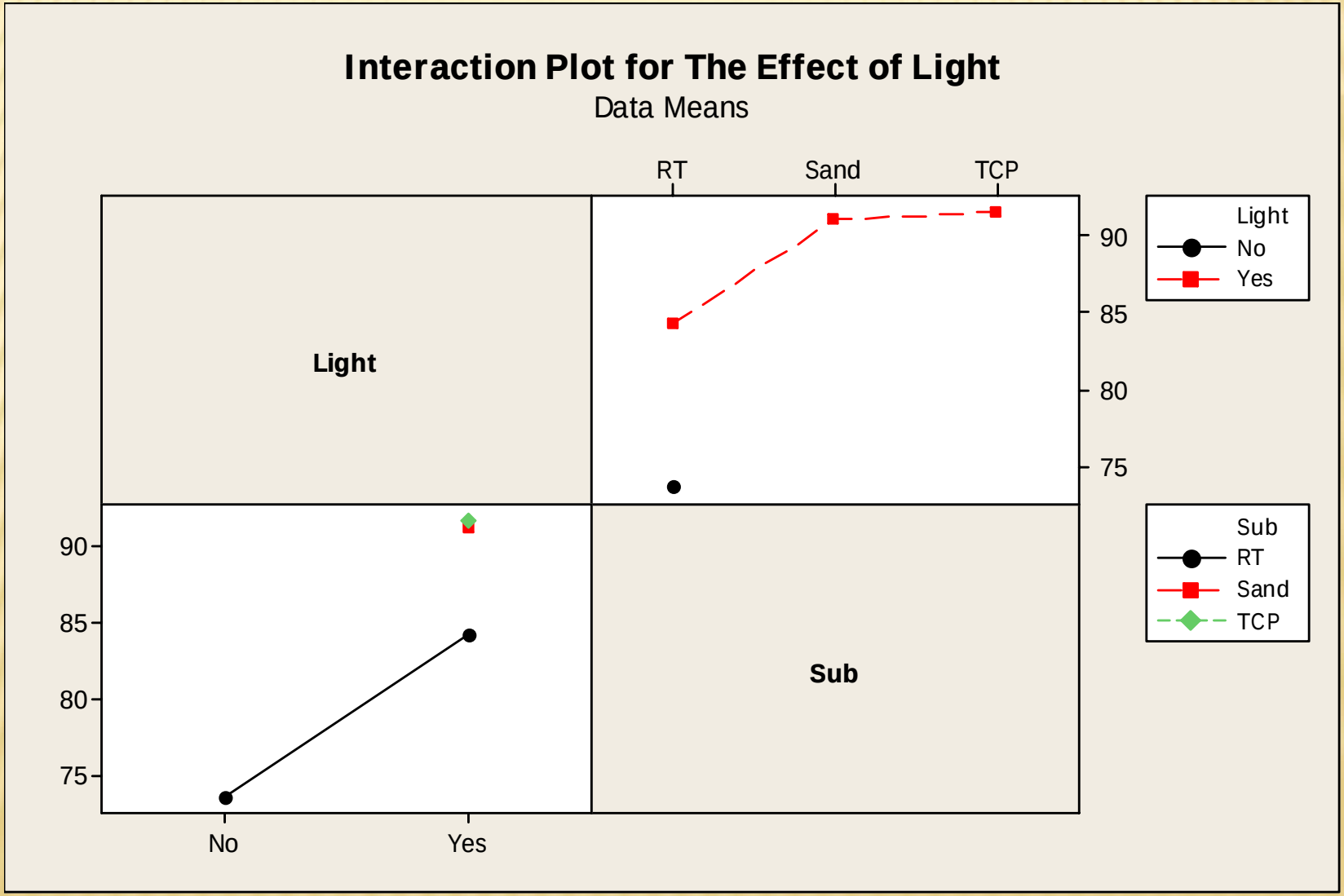
HISTORY AND DESIGN

- Testing Agricultural and Vegetable Seeds, Handbook No. 30, page 141 describes corn abnormality (4) a shortened plumule, extending no more than one-half the way up through the coleoptile. A weak seedling exhibits this symptom in figure 40. ISTA Rules for Testing Seed, Edition 2007, abnormal seedling definitions (5.2.5.A.VI) separates coleoptile abnormalities in POACEAE into: The coleoptile for all species except *Zea mays* and The coleoptile for *Zea mays* only:.. And this description excludes the leaf less than half the length of the coleoptile.
- The leaf less than half the length of the coleoptile abnormality, since the CCP tray method became popular, has been viewed by some as a testing artifact.
- Seed was solicited from a number of seed companies, shipped with no identifying information to the Iowa Seed Science Center. Samples were divided down to provide participants with sufficient seed to conduct four different tests.
- Referee participants were solicited across the United States. Due to the fact that samples were blind it was not feasible to ship to Canada. CSAAC, concurrently, conducted a similar referee.
- Referee participants were urged to test the seed in their usual method as well as any method they wished to add. The only specific direction was to count and record: normal seedlings, seedlings with leaf less than half the length of the coleoptile, all other abnormal seedlings and dead seeds. Laboratory's were to indicate substrate, temperature and lighting as well as any other testing condition and additional remarks on abnormal seedling types.

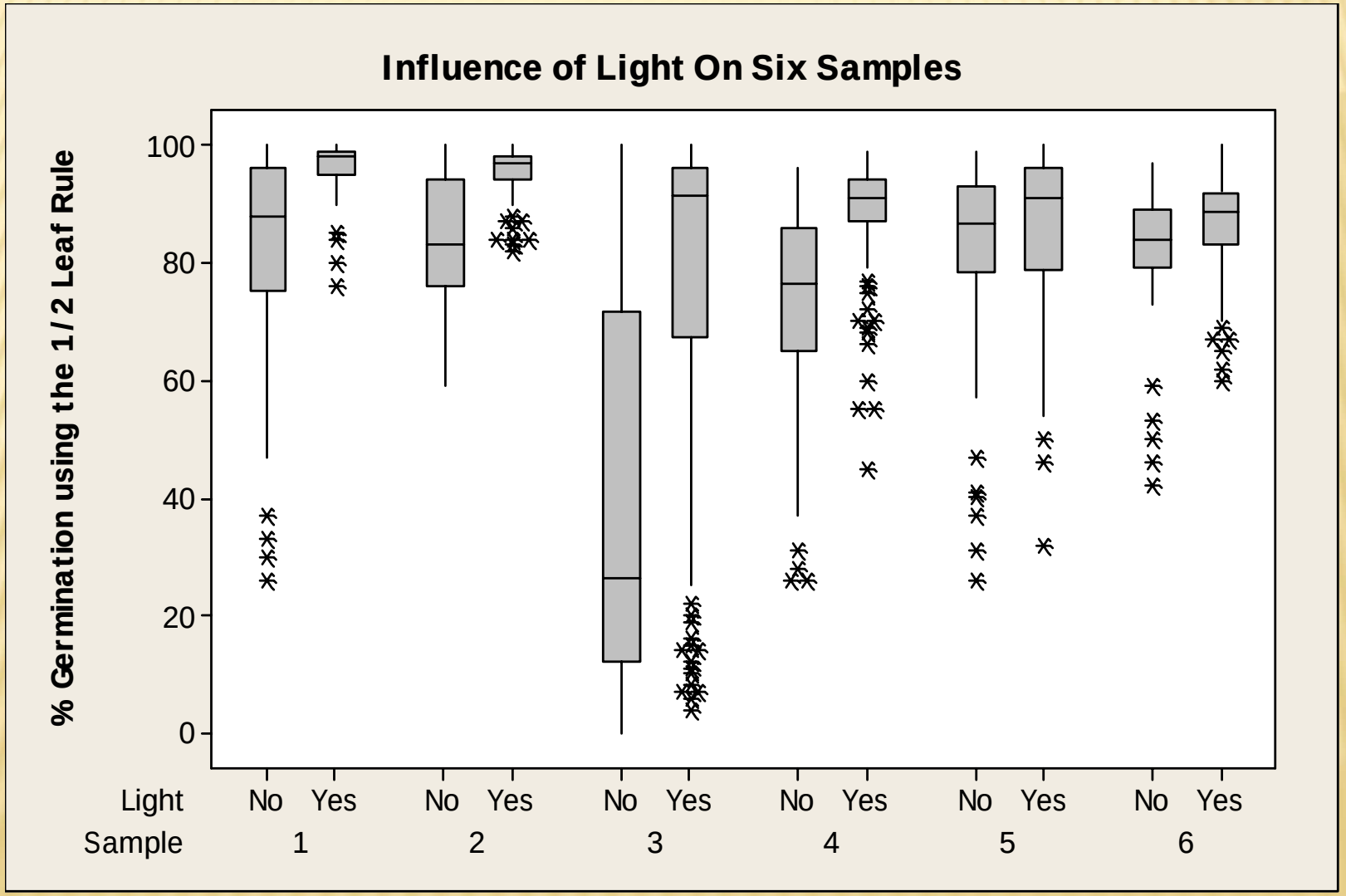
THE REFEREE

- Seed was sourced from a number of companies
- Six samples were provided for testing with varying degrees of the abnormality
- Twenty individuals reported results following the referee announcement
- The individuals tested the seed with at least two different methods: Light or No Light
- Substrates included Roll Towels, crepe cellulose paper, and sand

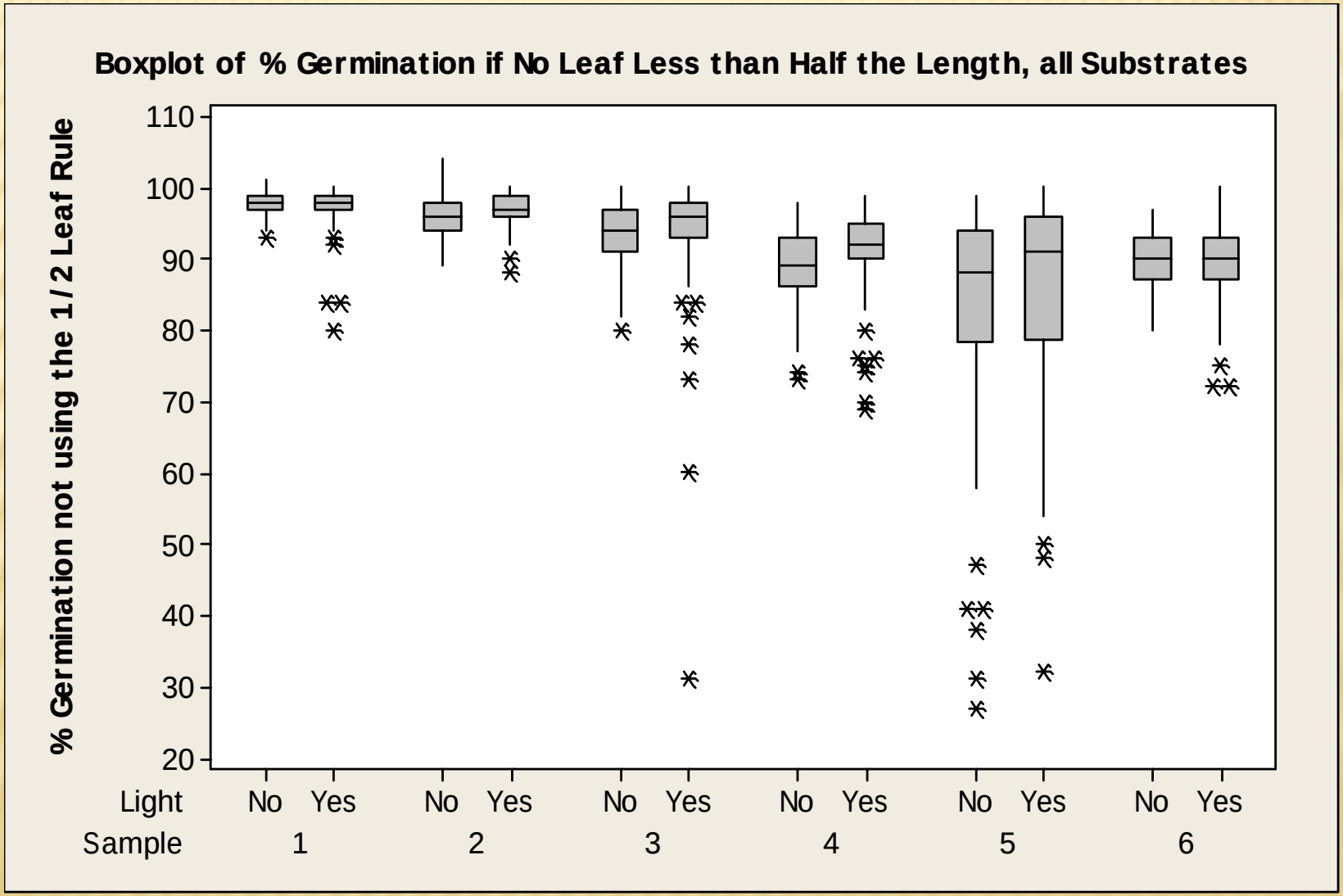
GERMINATION OF SIX SAMPLES ACROSS THREE SUBSTRATES



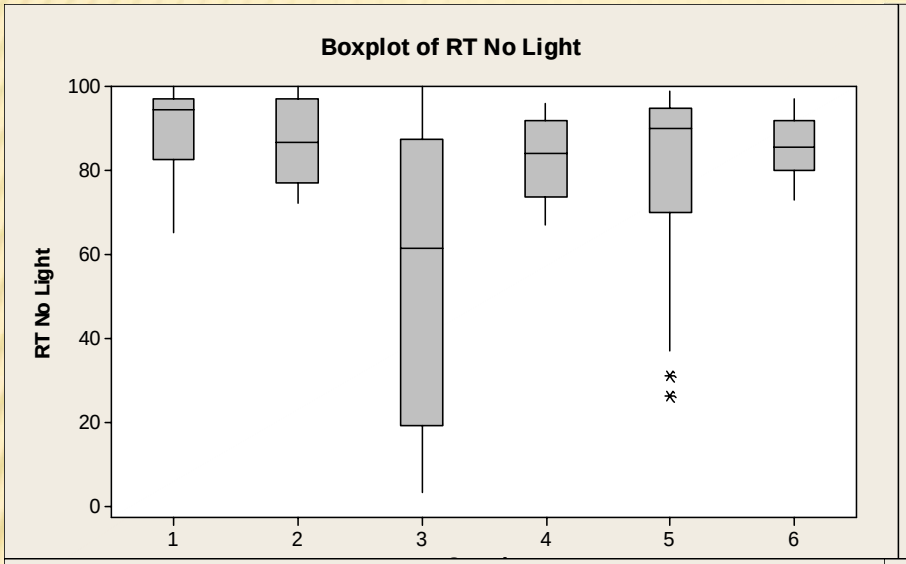
INFLUENCE OF LIGHT ON REDUCING VARIABILITY

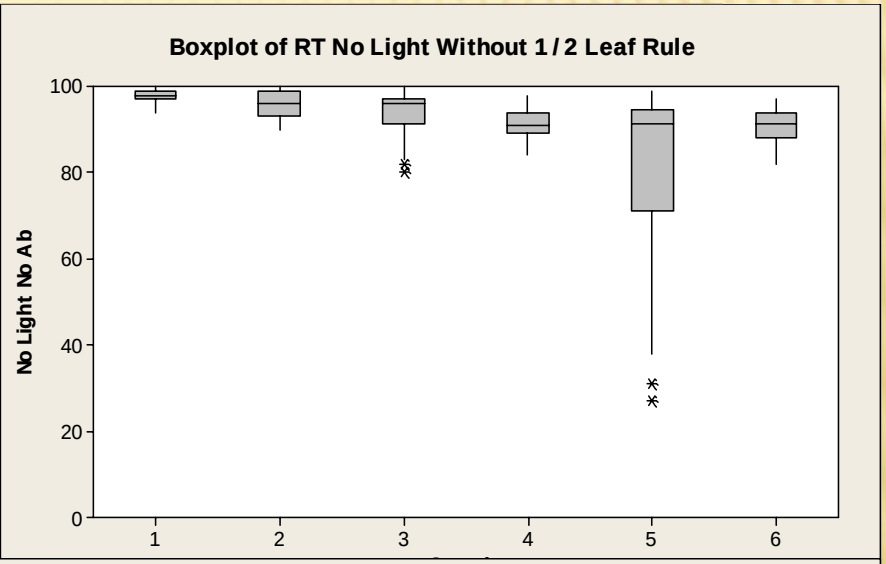


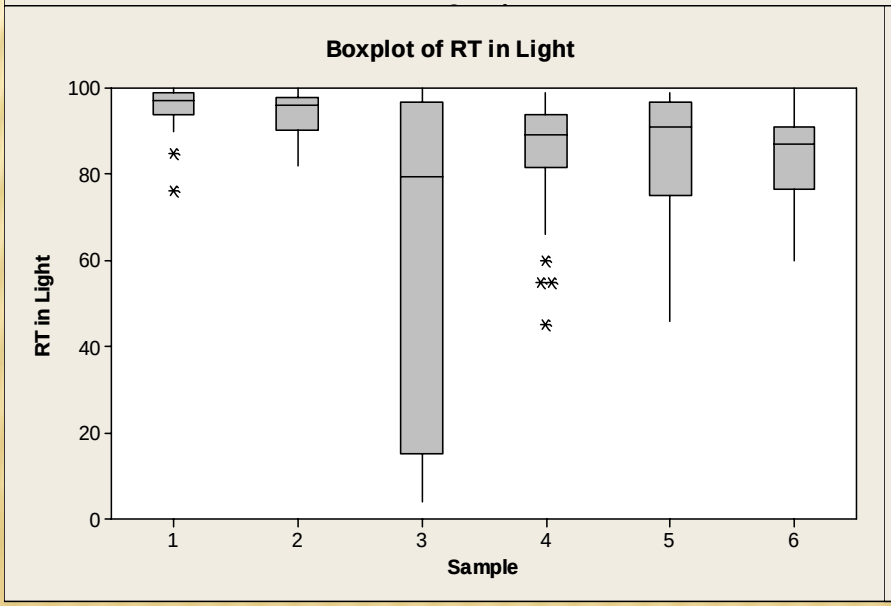
VARIABILITY IF THERE WAS A RULE CHANGE

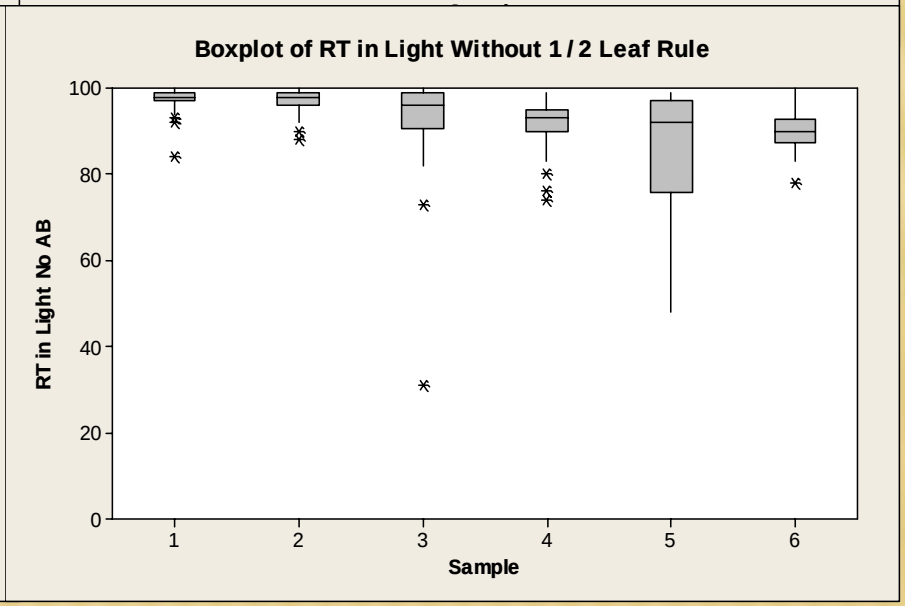


ROLL TOWEL TESTS ONLY: CURRENT OR PROPOSED RULE CHANGE









INDIVIDUAL TEST VARIABILITY

	No Light-Number of Tests	Number Out of Tolerance	% Individual Tests OOT	Light-number of Tests	Number Out of Tolerance	% Individual Tests OOT
Single Test, Rep to Rep	117	24	20.51	115	14	12.17
Roll Towel	117	24	20.51	63	2	3.17
Sand				35	10	28.57
Crepe Cellulose Paper				18	2	11.11
If No Leaf <1/2 Rule	117	9	7.69	115	14	12.17

FIRST TEST VS. SECOND TEST AT THE SAME LAB

- 68 of the 116, or 58.62%, of the tests were out of tolerance when comparing no light to light using the ½ leaf rule
- 5 of the 116, or 4.31%, of the tests were out of tolerance when comparing no light to light if the ½ leaf rule was abolished
- On Roll Towels the addition of light alone did not solve the variability with these samples

NEXT STEP:

- A number of locations have volunteered to conduct seedling emergence counts on the six samples
- Seedlings will be destroyed upon completion of counts
- Results will be made available to the members of AOSA/SCST upon summarization

THANKS AND ACKNOWLEDGEMENTS

- Iowa State University, Mike Stahr- Packaging, Randomization
- Harold Armstrong, Statistical Analysis
- Seed provided by: AgReliant Genetics, Monsanto, Pioneer Hi-Bred
- Land and Employee time for emergence studies: Iowa State University Seed Lab, Monsanto, Pioneer Hi-Bred,

PARTICIPANT LABS:

- Participating Laboratories:

  AgReliant Genetics, BioDiagnostics Inc., CalWest Seeds, Eurofins STA-Gilroy, Harris-Moran Seed Co., Harris Seeds, Illinois Crop Improvement, Iowa State University, Kent Agri Lab Ltd., Michigan Crop Improvement, Monsanto-Waterman, Monsanto-Oxnard, Pioneer Hi-Bred, SGS North America-Brookings, & University of Kentucky.

- Some laboratories had multiple participants at that site