

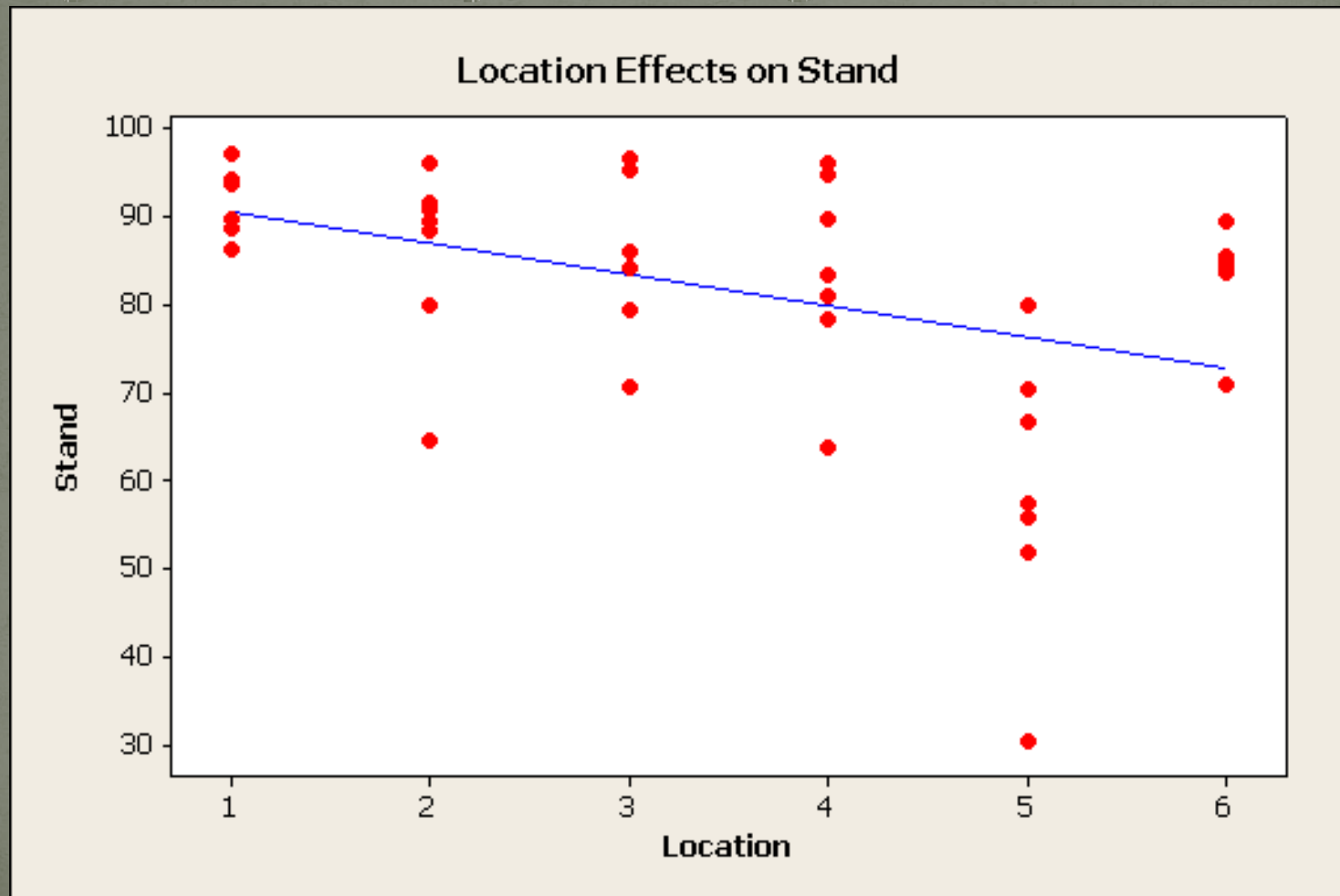
Mid West Referee- Leaf Less than Half the Length of the coleoptile

Field Emergence Study

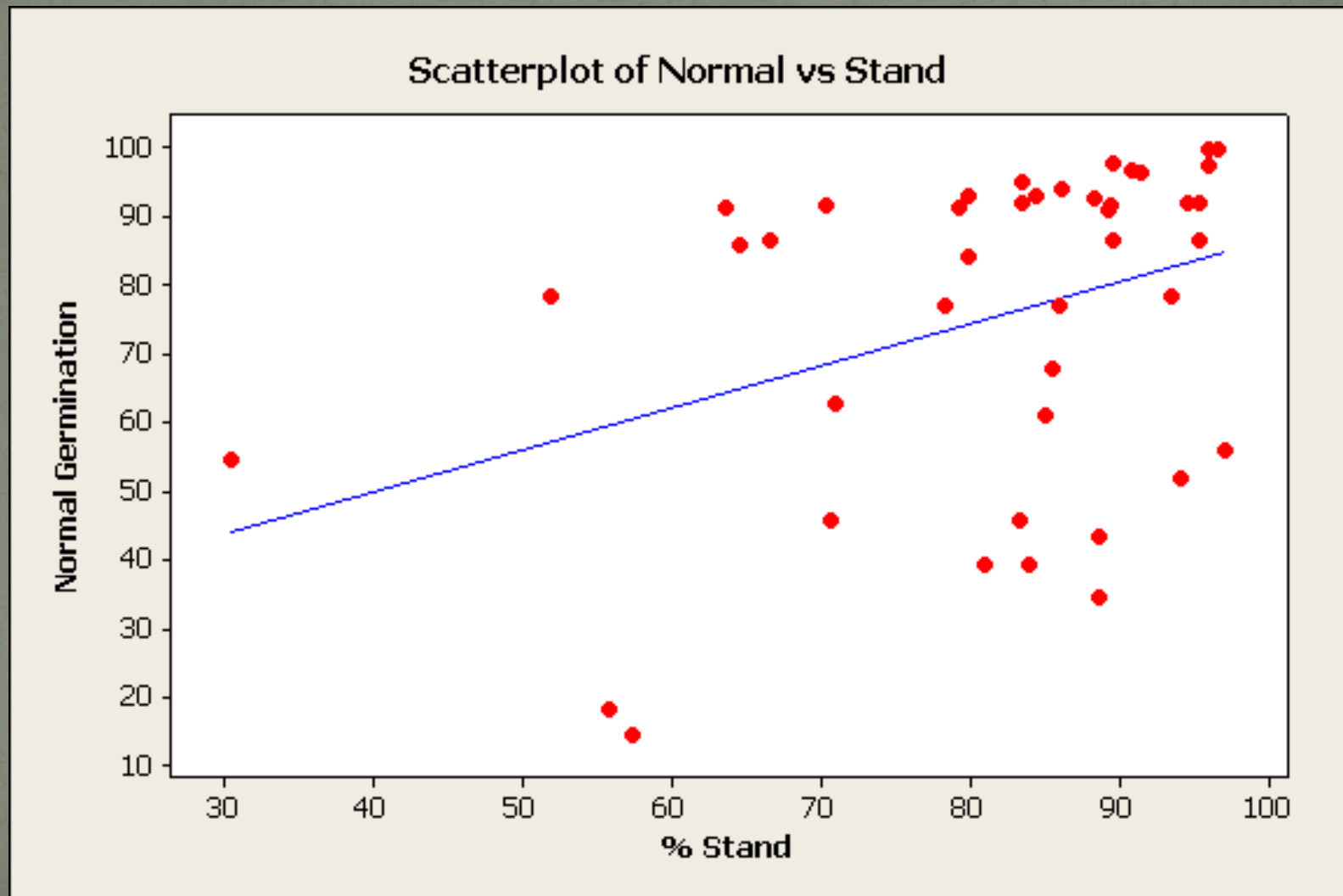
Field Emergence Study

- Five organizations agreed to plant samples into a field emergence study, one organization reported two planting dates.
- Design, plantings and counting procedures were left to the organization planting the field emergence study.
- Plots were destroyed following the counts.
- Plot planting dates varied widely, from the more optimal planting date to dates challenged by rainfall pooling and crusting.
- Field conditions caused counts to be spread out for more than a month.

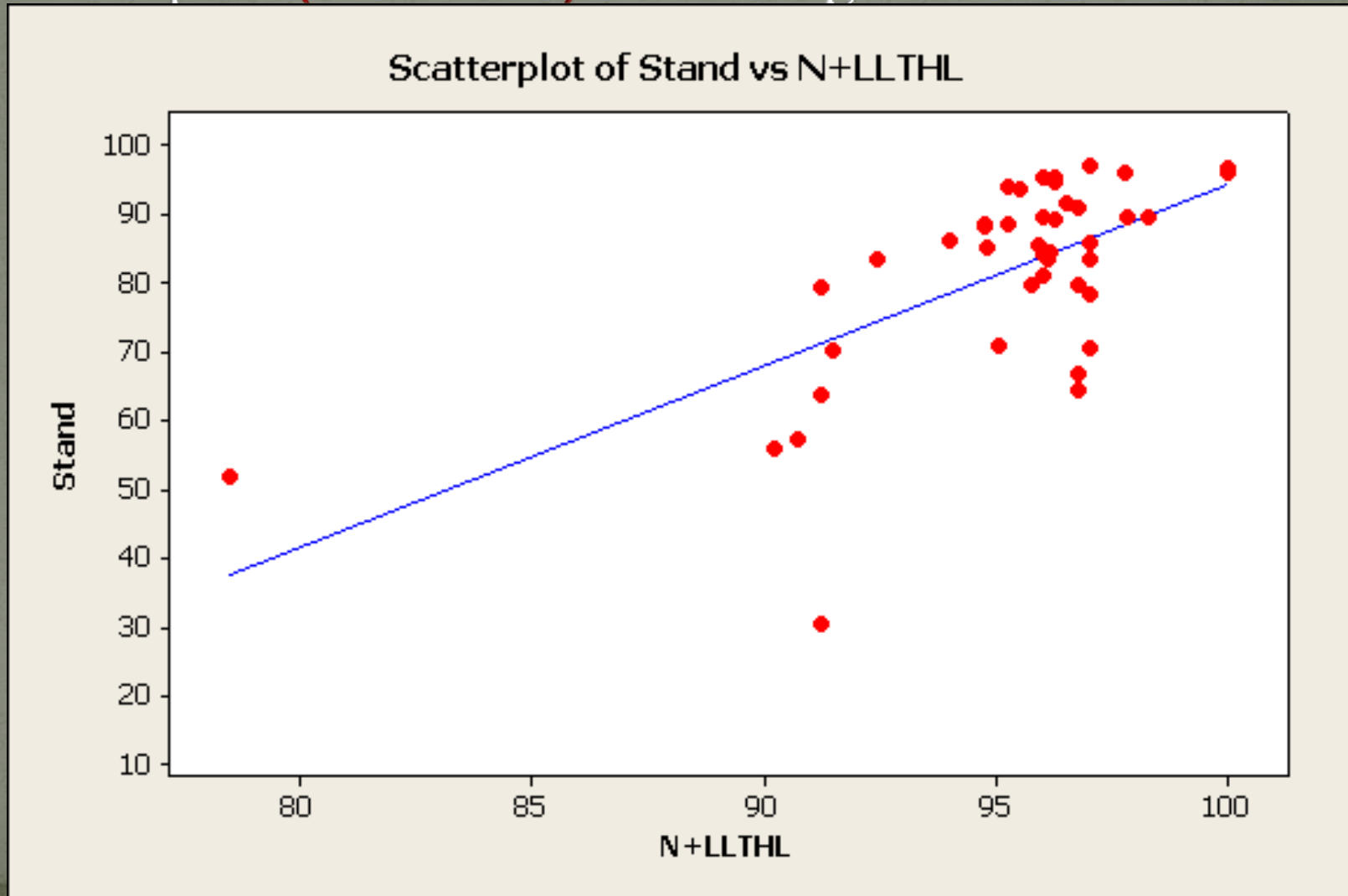
Location environmental effects lead to high variability in emergence.



Regression analysis showed a poor correlation between % normal germination and ensuing stand



A much stronger trend line was observed when correlating Normal plus Leaf Less than half the length of the coleoptile (**N+LLTHL**) to ensuing stand



There is greater correlation between stand and N+LLTHL than with Normal Germination

Regression Analysis: Stand versus Location, Sample, Normal

- The regression equation is
- $\text{Stand} = 91.8 - 3.44 \text{ Location} - 2.29 \text{ Sample} + 0.146 \text{ Normal}$

Predictor	Coef	SE Coef	T	P
Constant	91.805	9.166	10.02	0.000 ***
Location	-3.435	1.043	-3.29	0.002 **
Sample	-2.2886	0.9416	-2.43	0.020 *
Normal	0.14568	0.0799	1.82	0.076

- $S = 11.5362$ $R\text{-Sq} = 39.6\%$ $R\text{-Sq(adj)} = 34.9\%$

Regression Analysis: Stand versus Location, Sample, N+LLTHL

- The regression equation is
- $\text{Stand} = -98.1 - 2.49 \text{ Location} - 0.994 \text{ Sample} + 2.02 \text{ N+LLTHL}$

Predictor	Coef	SE Coef	T	P
Constant	-98.08	58.65	-1.67	0.103
Location	-2.4882	0.9916	-2.51	0.016 *
Sample	-0.9936	0.9681	-1.03	0.311
N+LLTHL	2.0220	0.5811	3.48	0.001 ***

- $S = 10.4756$ $R\text{-Sq} = 50.2\%$ $R\text{-Sq(adj)} = 46.3\%$

Stepwise Regression: Stand versus Location, Sample, N+LLTHL, Normal

Step	1	2	3
Constant	-169.6	-133.9	-123.2
N+LLTHL	2.64	2.35	2.13
T-Value	5.32	4.84	4.46
P-Value	0.000	0.000	0.000
Location		-2.32	-2.35
T-Value		-2.37	-2.51
P-Value		0.023	0.016
Normal			0.142
T-Value			2.10
P-Value			0.042
S	11.1	10.5	10.1
R-Sq	41.46	48.84	54.18
R-Sq(adj)	40.00	46.22	50.56
Mallows Cp	9.7	5.7	3.3
PRESS	6264.44	5595.13	4900.05
R-Sq(pred)	25.22	33.21	41.50

- The Stepwise Regression analysis adds the most important factor to the prediction equation first and then determines the next most important factor and so on until the next most important factor is not significant.
- The N+LLTHL calculation, or removing the leaf less than half the length of the coleoptile abnormality from the rules, was the strongest predictor of field emergence in this study.
- Location had a significant impact on field emergence, considering the spring, this is entirely predictable.
- The variability in germination between samples was so great that samples did not figure into the regression equation.
- Under the best field conditions in the study there was virtually no difference between emergence and N+LLTHL.
- Overall more than 40% of the difference in emergence was attributed by N+LLTHL

Conclusions:

- The leaf less than half the length of the coleoptile abnormality adds considerable variability between reps in an individual test, between substrates and between labs. (Mid West Referee- Leaf Less than Half the Length)
- Abolishment of this abnormality would result in significantly less variability both within and among laboratories.
- Elimination of this abnormality lead to a stronger predictor of field emergence than germination by the rules.
- A second year of the germination phase of the study would be valuable to confirm results experienced in the referee.

Thanks to the following for providing space, equipment and manpower to ensure success in this field emergence referee

- *AgReliant Genetics*
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- *Monsanto*
- *Pioneer Hi-bred Int'l*