



Screening the *G.*

hirsutum collection for
resistance to *R.*
reniformis

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Major long-term objectives

- Evaluate all available accessions of *G. hirsutum* (TX list) for reaction to reniform nematode.
 - Determine heritability of resistance, if any.
 - Incorporate resistance into adapted germplasm.
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Evaluation process

- Accessions are evaluated in the greenhouse in the initial stage.



Reniform resistance evaluation

- 4 reps (single plants) are evaluated, inoculated with a “mix” of reniform populations (1000 vermiform/150cc soil).
- 50 accessions per screening.



Reniform resistance evaluation

- After 60 days, nematode populations are determined and a reproductive factor calculated.
- Multilevel approach is used.



Reniform evaluation

- Two factors related to resistance are initially examined:
- Vermiform numbers, a measure of the ability of the nematodes to survive, and
- Eggs, which measure reproduction.





Reniform evaluation

- Accessions in the lowest 10 percentile for each parameter will be advanced to the next level of evaluation.
 - Final evaluation will take place in the field to confirm any greenhouse resistance.
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Progress so far:

- Approx. 1000 accessions evaluated (about 25% of total collection)
 - 865 accessions had complete data
 - Problems with germination
 - Paymaster 1218 in every set
 - Preliminary analysis
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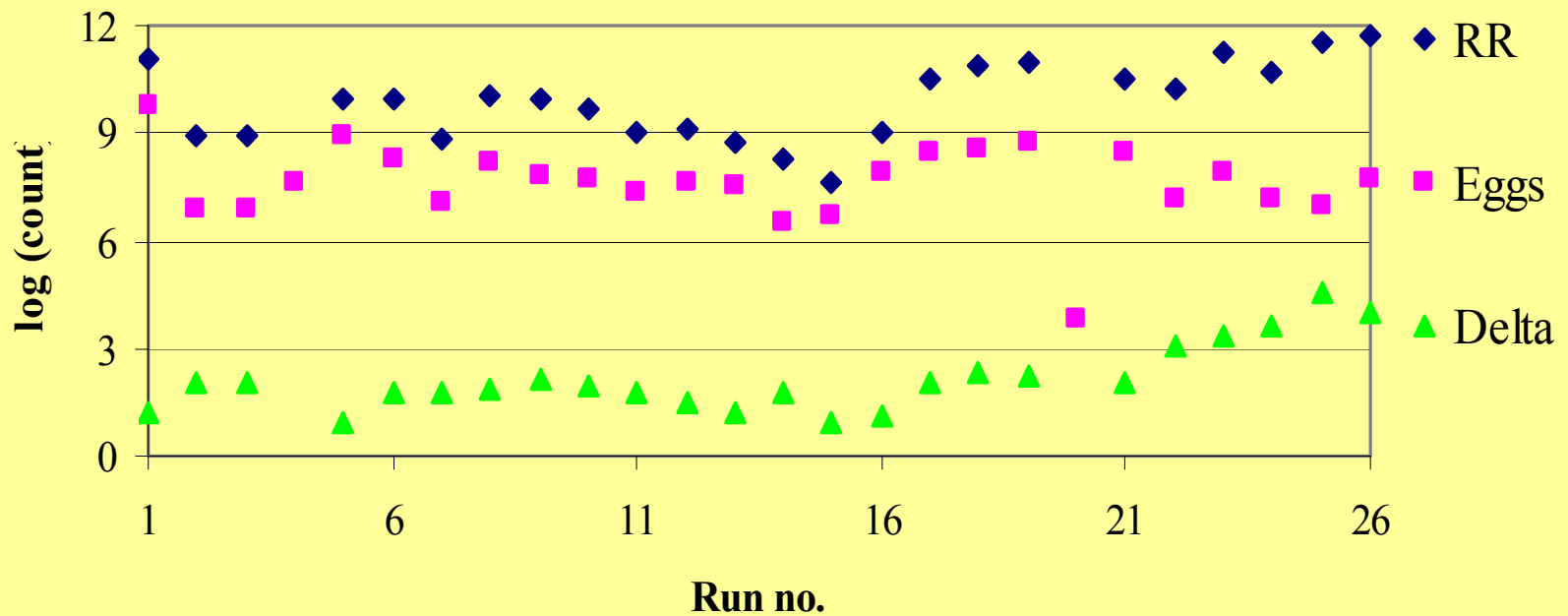


Preliminary analysis

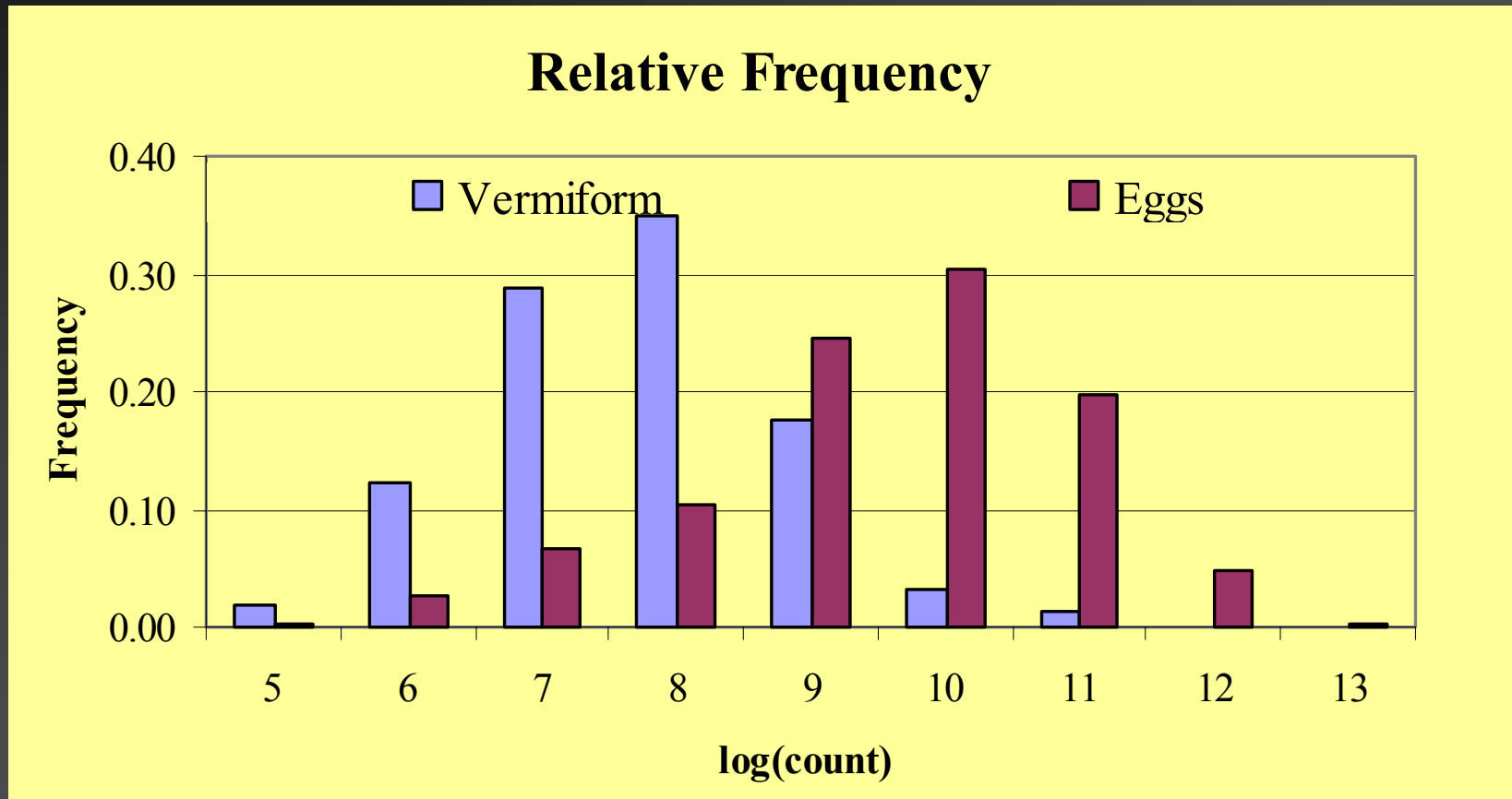
- Data normalized through log transformation
 - Vermiform vs. eggs
 - Paymaster 1218
 - Accessions
 - Accessions standardized based on Paymaster 1218
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Vermiform or eggs?

Paymaster 1218

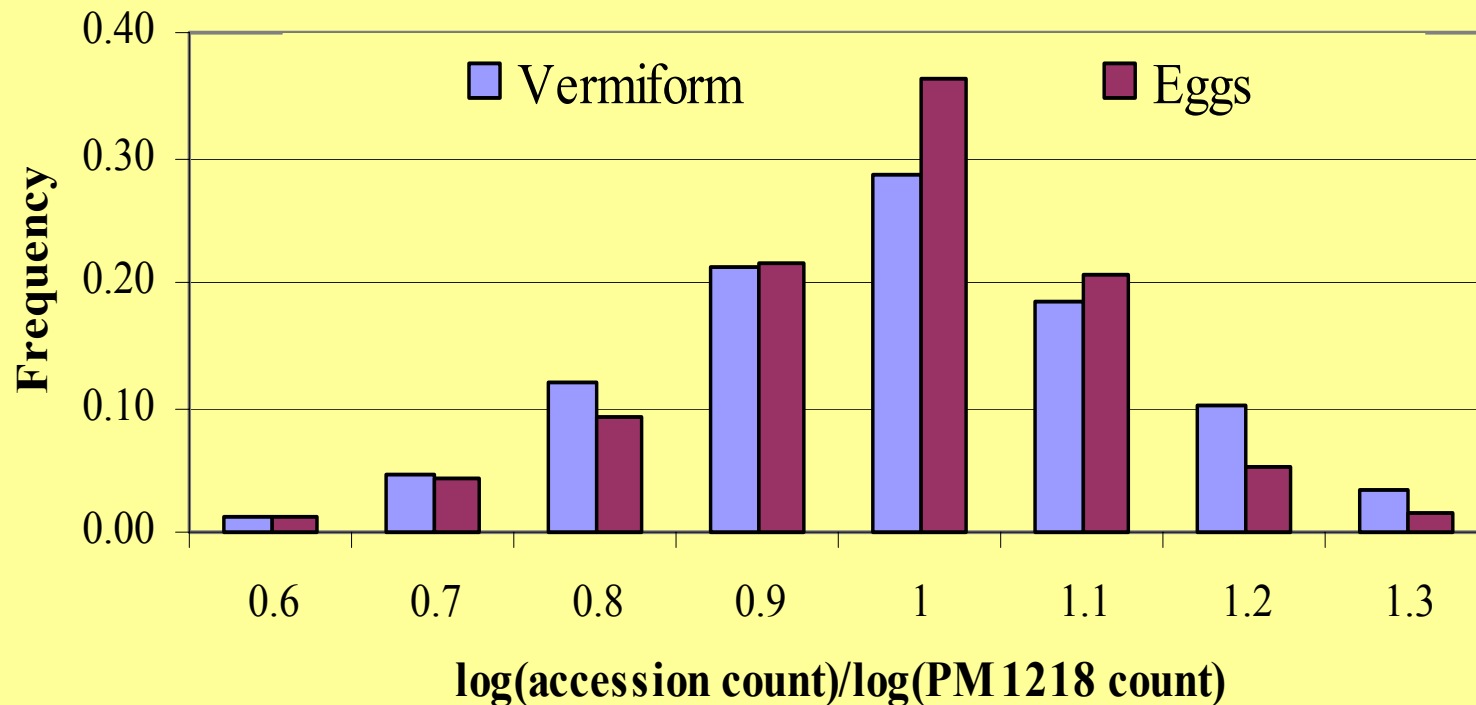


Log(counts) – 865 accessions

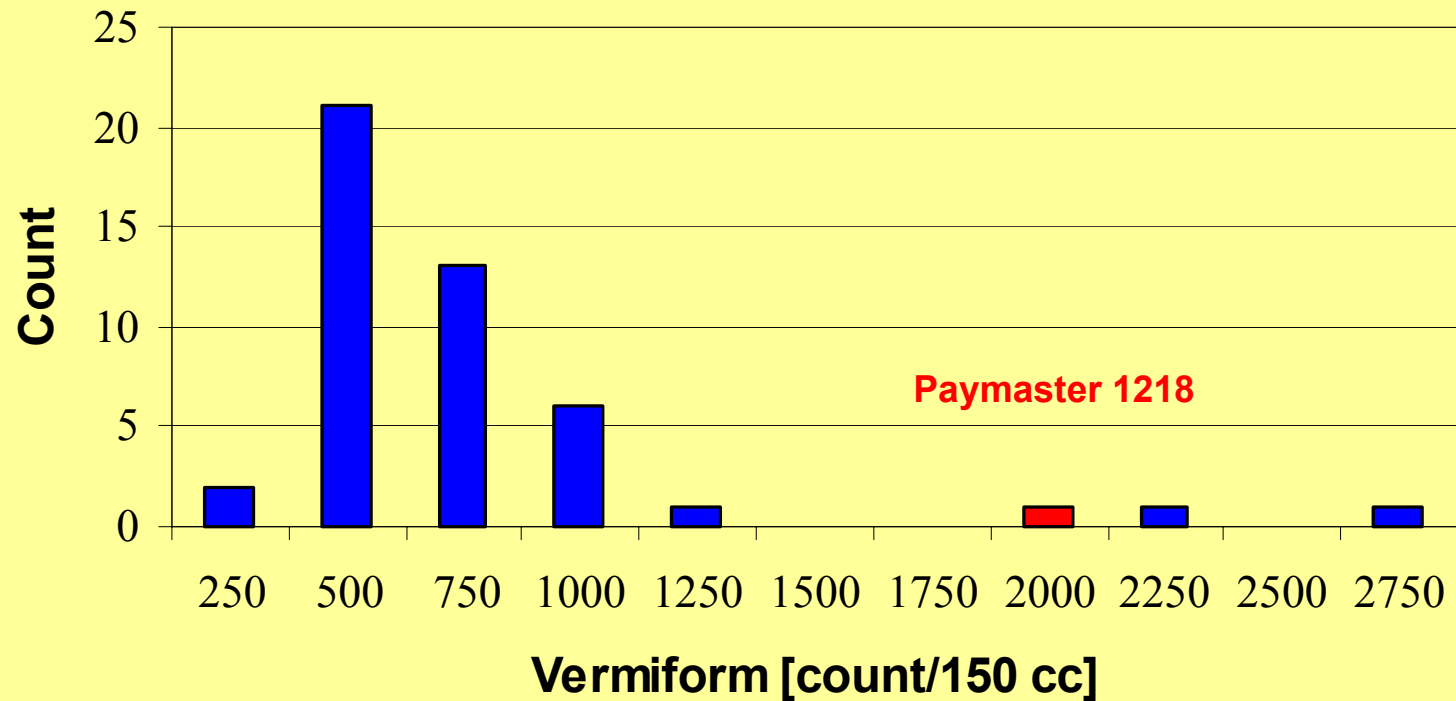


Counts relative to PM 1218

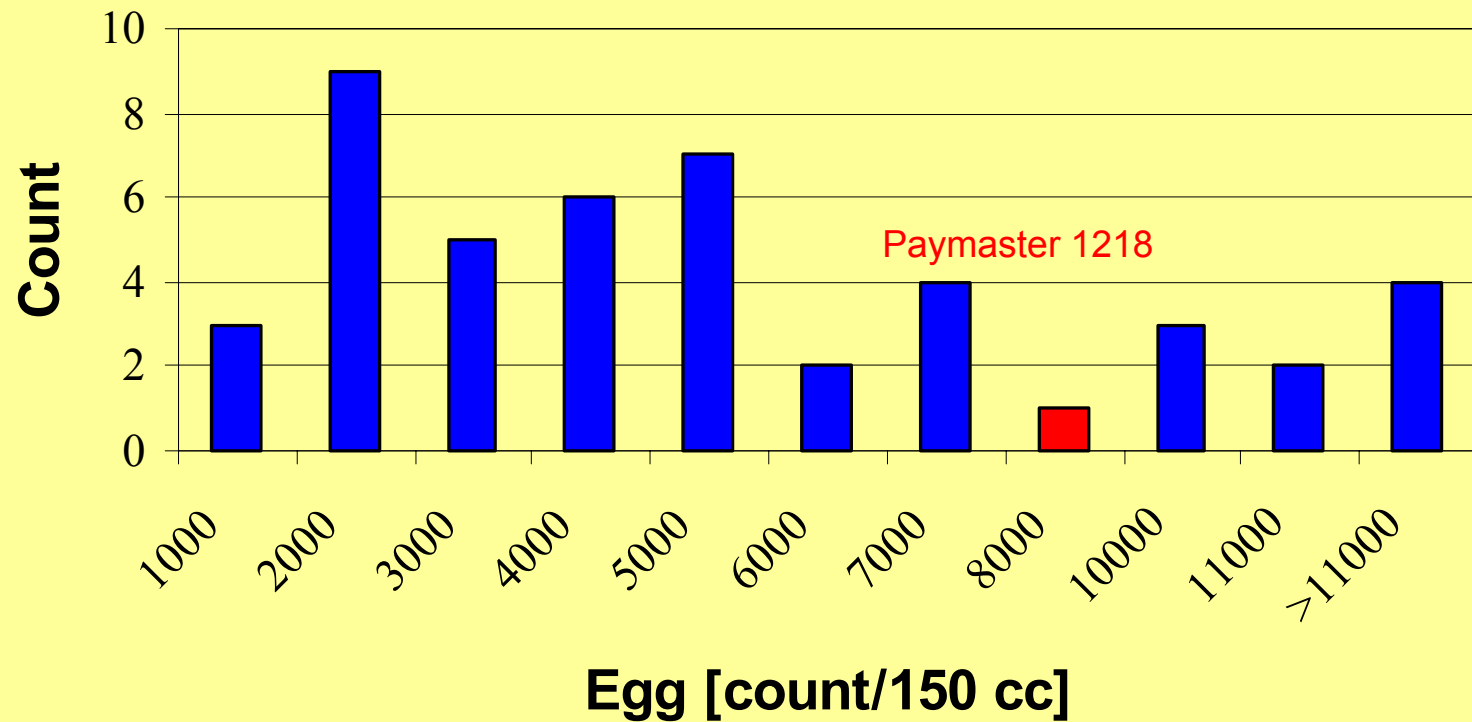
Relative Frequency of Normalized Logs



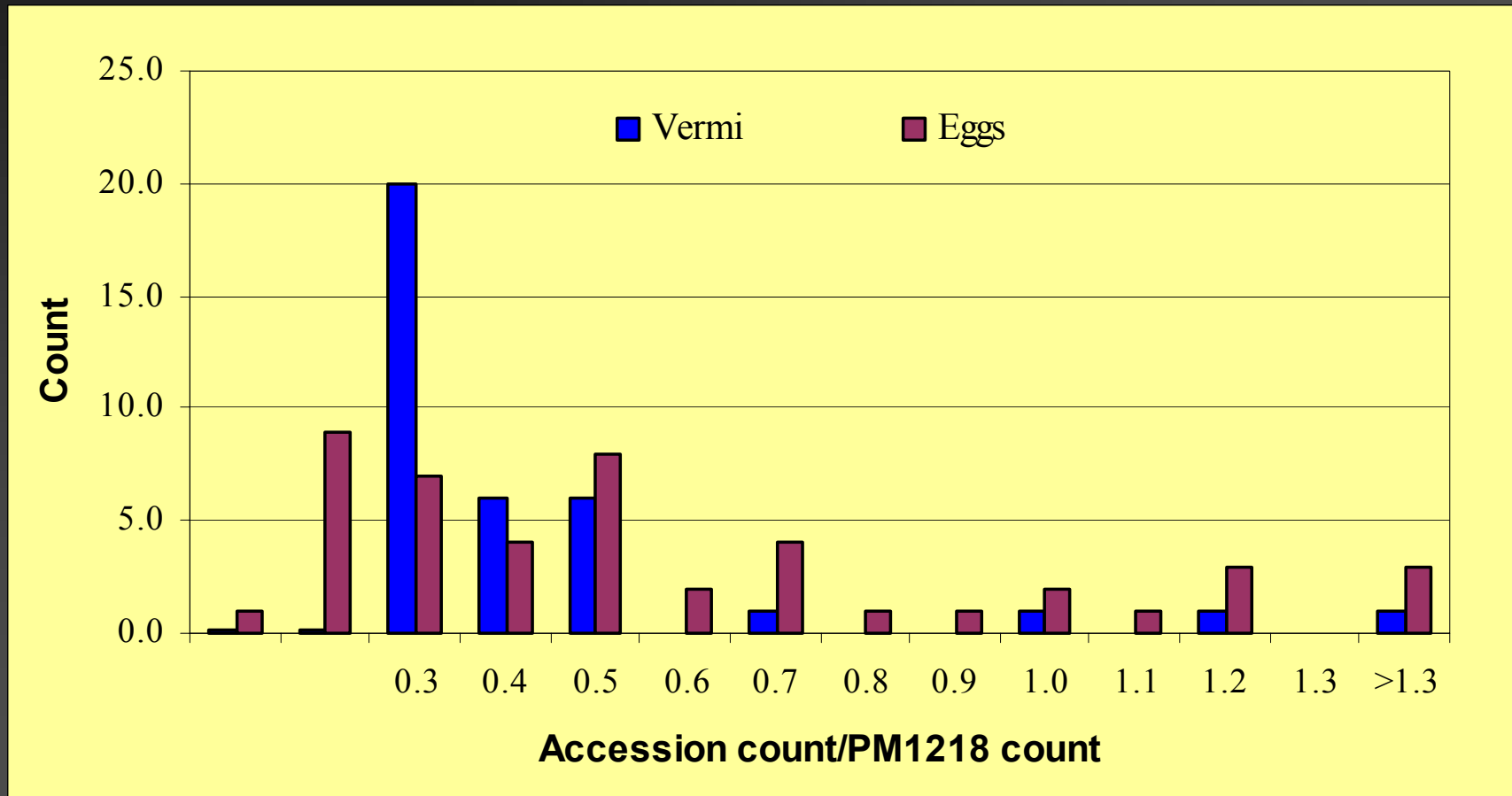
Data for set 7 – an example



Egg counts for set 7



Actual counts relative to PM 1218





Criteria for advanced testing

- V scheme
 - lowest 10th percentile for vermiform counts
- E scheme
 - lowest 10th percentile for eggs counts
- V & E scheme
 - Selecting the lowest 22% for both resulted in an overall advancement of the lowest 10th percentile



What did we select?

Selection scheme	Unique	Shared with		Shared by all three
		E	V & E	
V	4.2	0.0	2.9	2.9
E	5.3	---	1.7	
V & E	2.5	---	---	

Values are % of total number evaluated



Future work

- Continue screening using present methods until all accessions are evaluated.
 - Re-evaluate and confirm resistance of selected lines.
 - Four accessions will be planted in the greenhouse (for crossing) this month based on current evaluations.
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