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.

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.

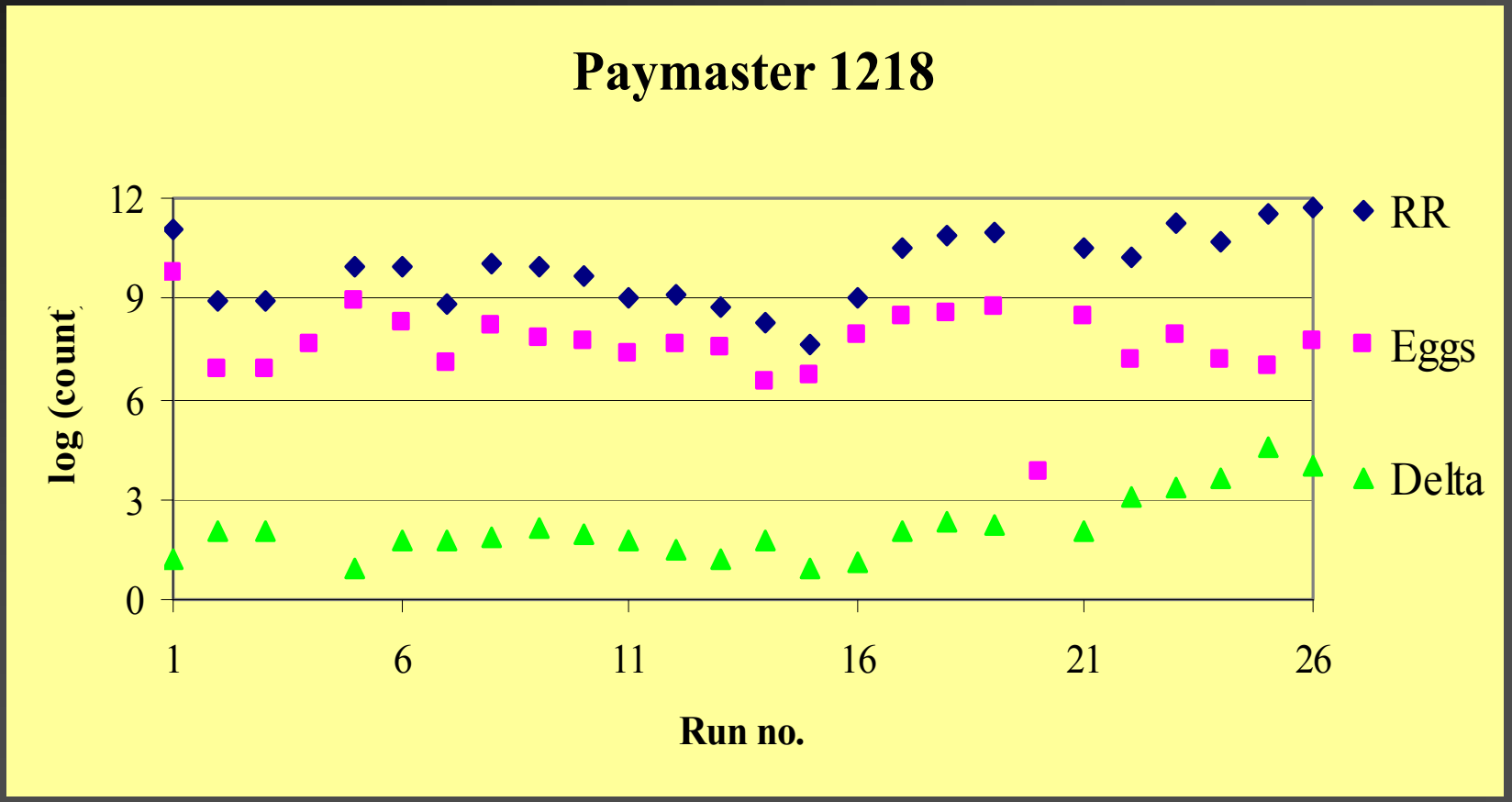
Progress so far:

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

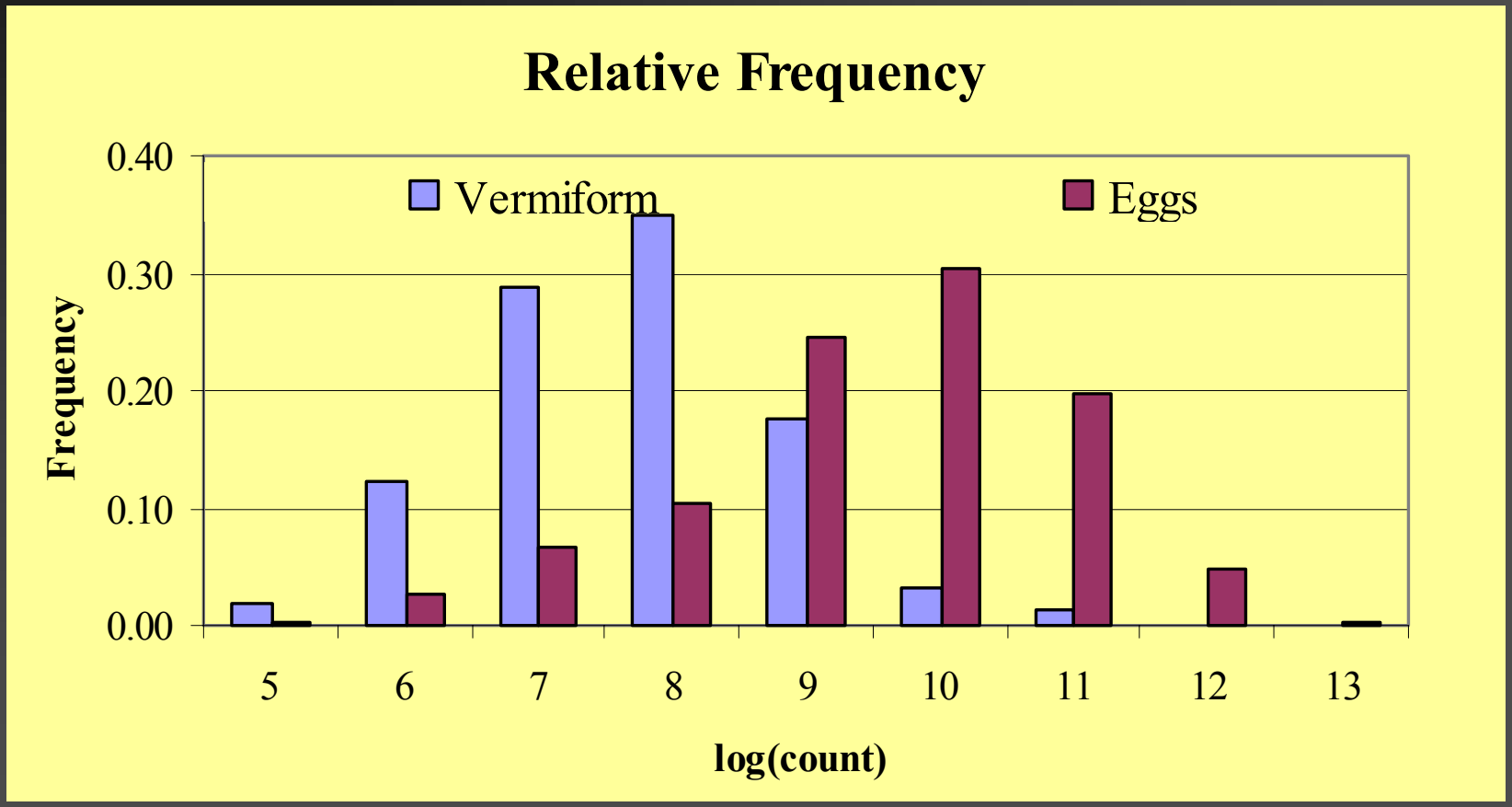
Preliminary analysis

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

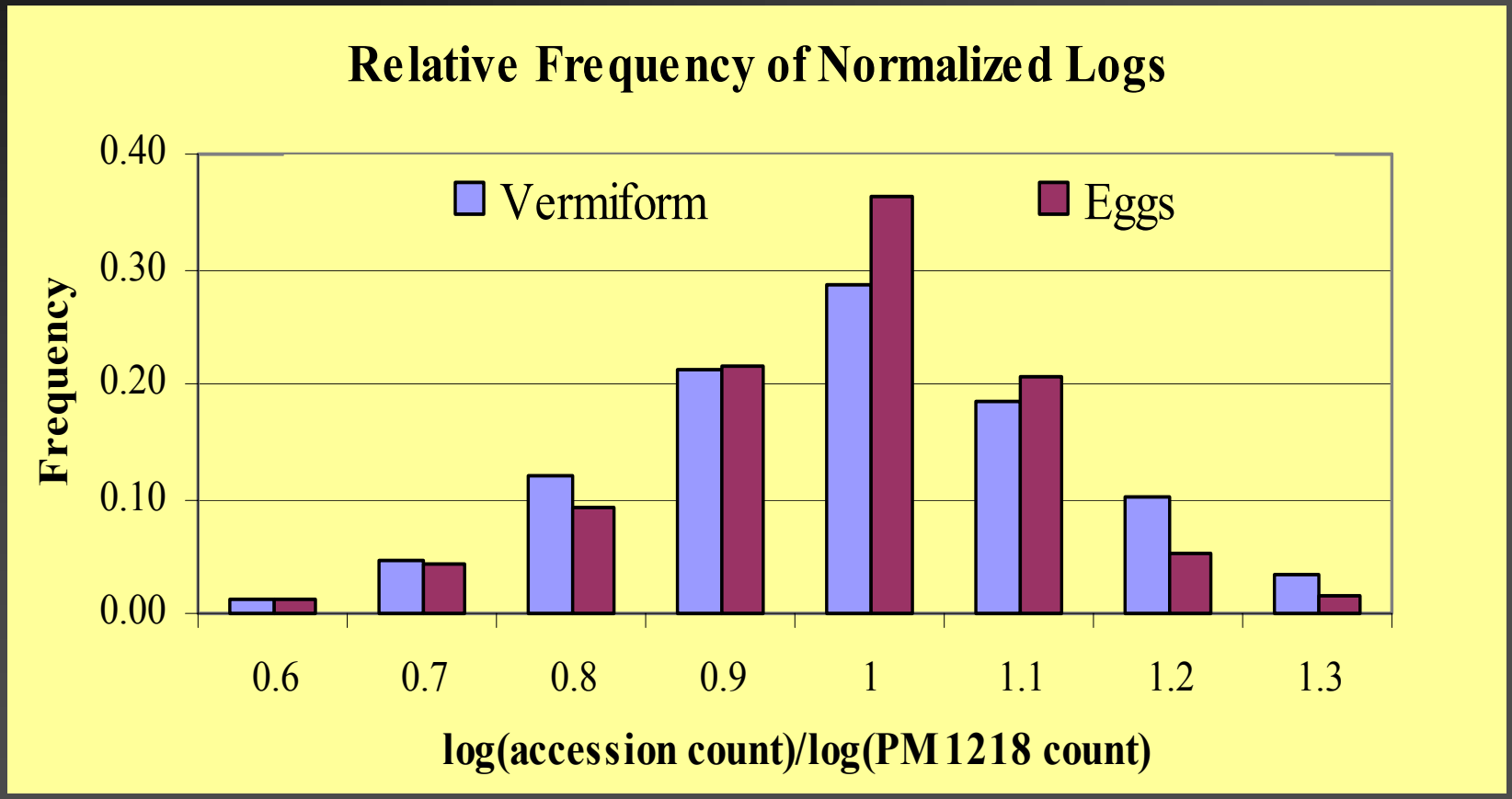
Vermiform or eggs?



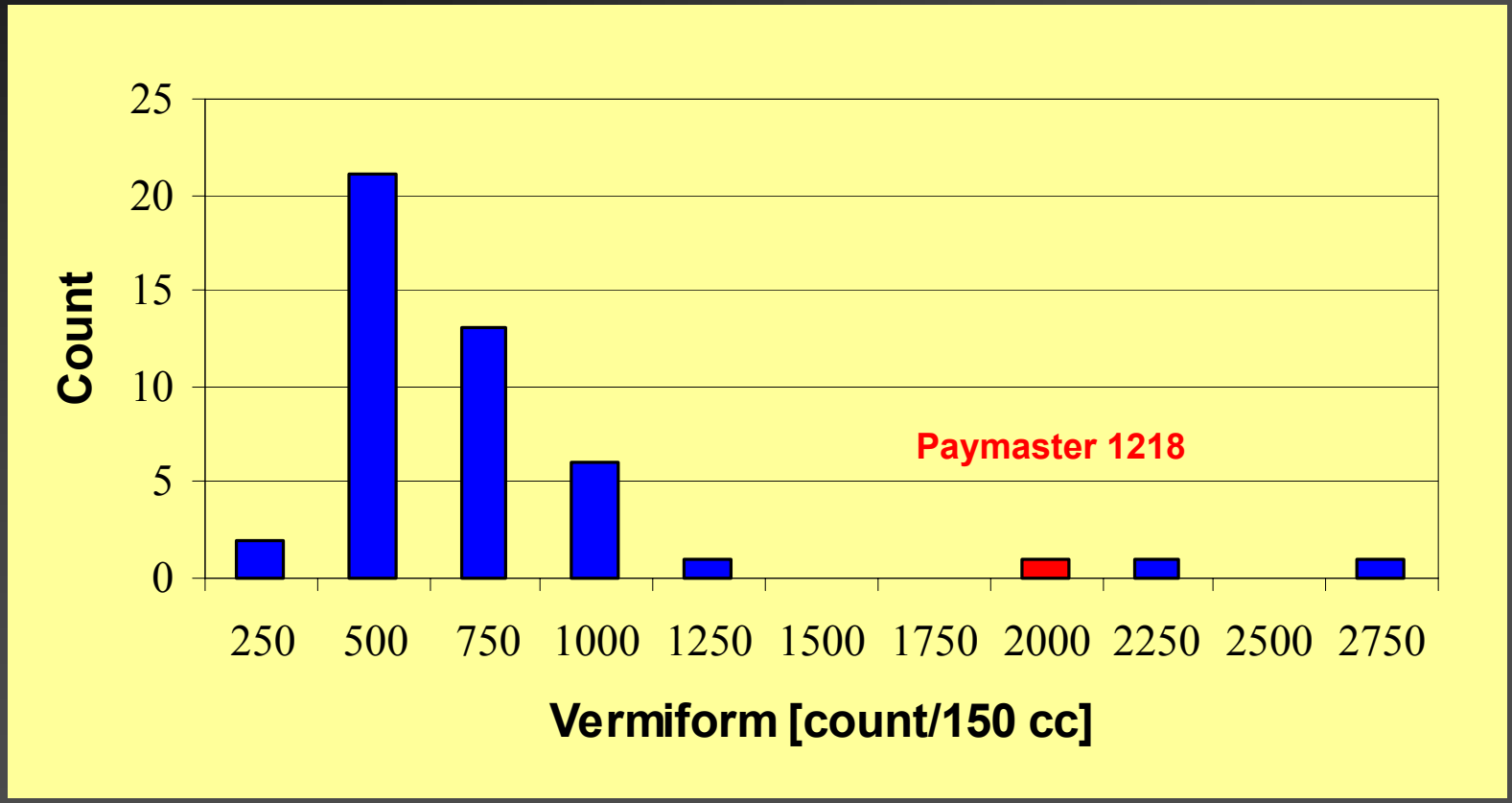
Log(counts) – 865 accessions



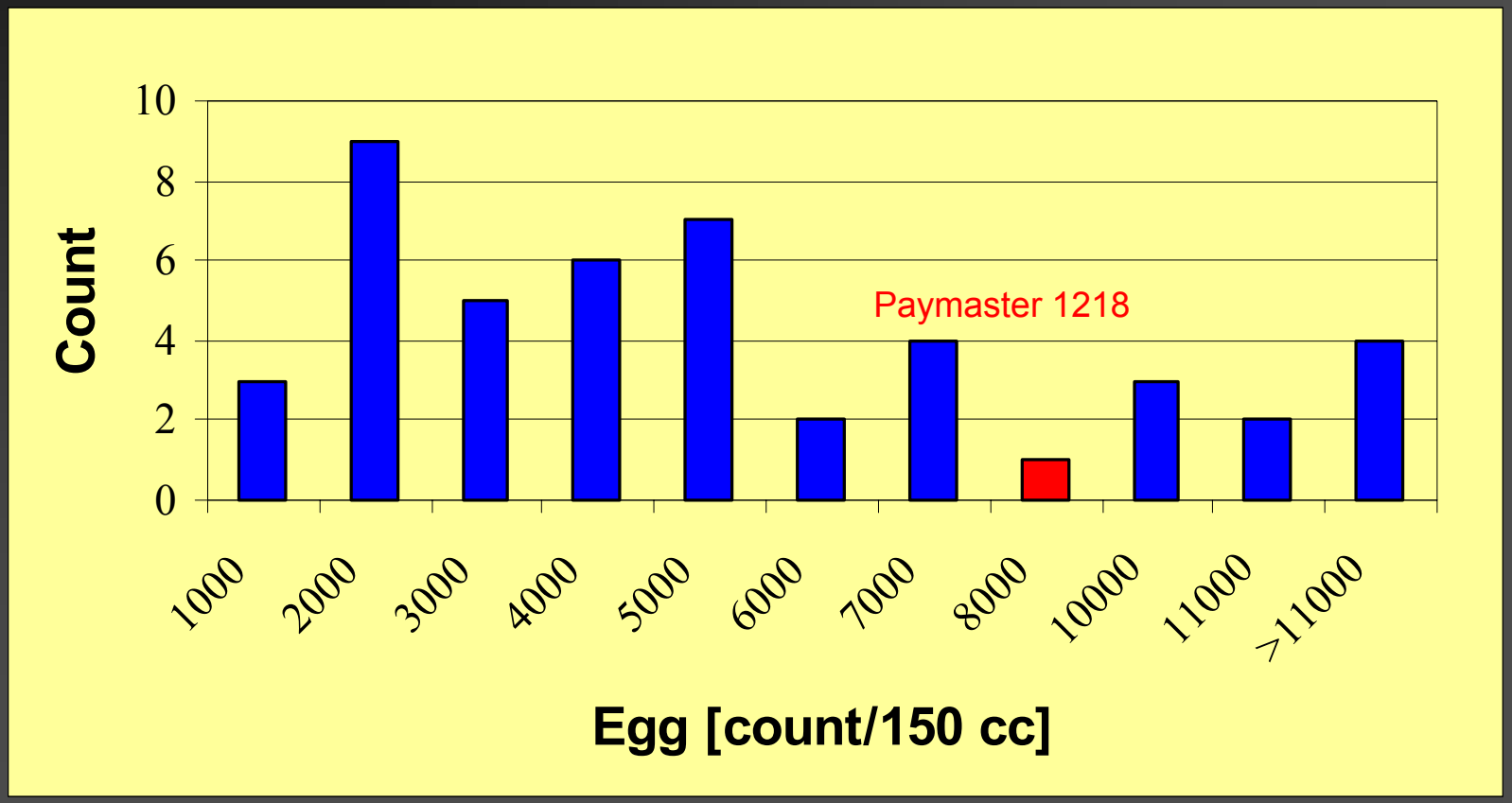
Counts relative to PM 1218



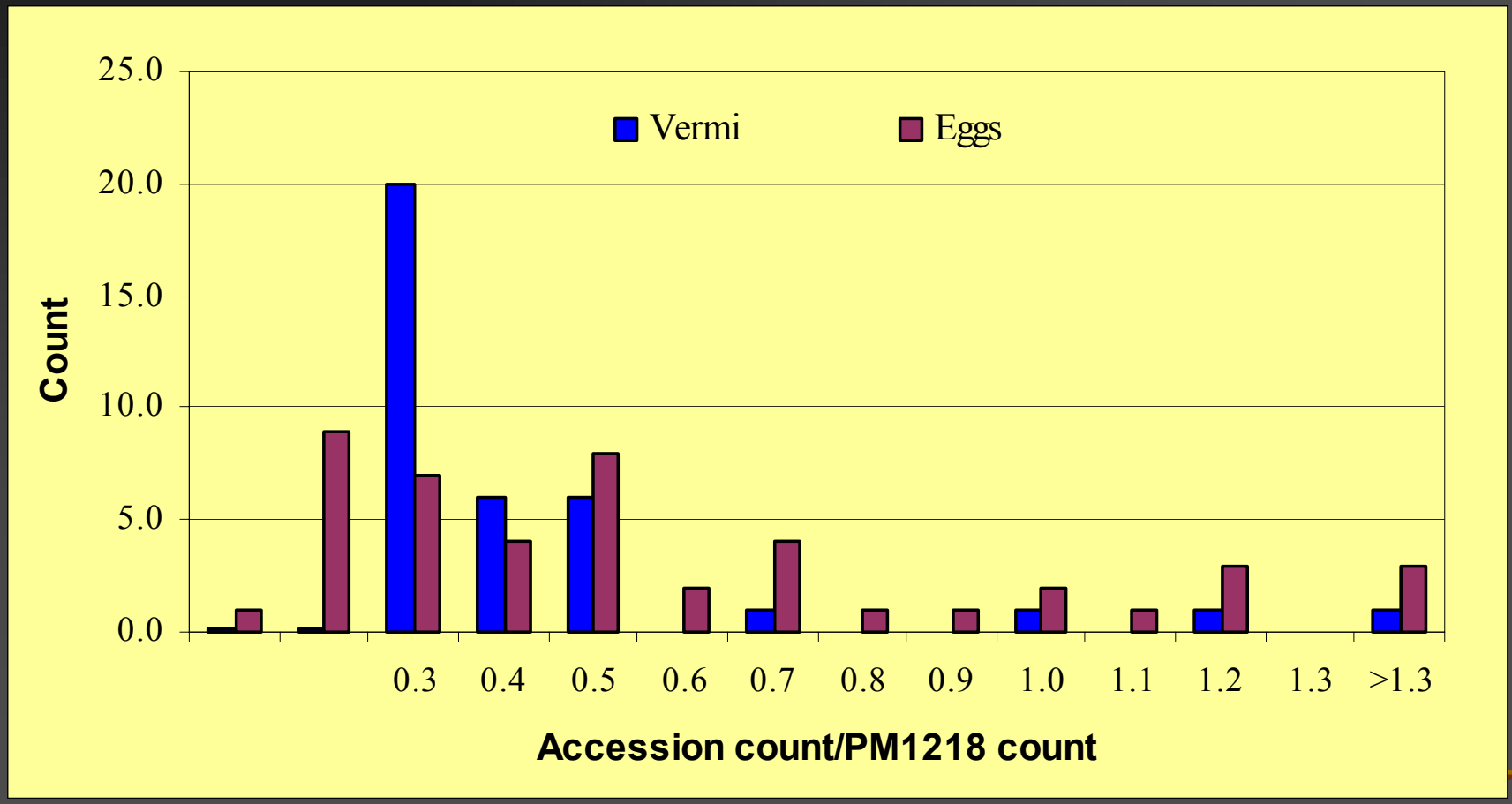
Data for set 7 – an example



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 E	Shared with V & E	Shared by all three
V	4.2	0.0	2.9	
E	5.3	---	1.7	2.9
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.