

following additional results:

1. Soybean lines PI 437654 and PI 438489B both resistant to SCN race 3 were genetically similar for resistance.
2. PI 90763 and PI 89772 also resistant to nematode damage were similar in reaction.
3. 'Peking' and PI 438496B soybeans resistant to nematodes were also similar in reaction.
4. Resistant soybean lines, PI 88788, PI 89772 and PI 404198B are dissimilar to nematode reaction and appeared to have potential use. These three differences may be combined to produce additional levels of resistance to nematode race 3 damage in the soybean cultivars.

The Effect of Inbreeding on Soybean Cyst Nematode Virulence

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Using the hydroponic technique, characterize SCN development on three soybean hosts; 1) susceptible host, 2) resistant-selecting host and 3) resistant non-selecting host. Record percent of adult male, female and juvenile stages in each host after a standard period of development (e.g. 20 days) at a given temperature (e.g. 27 C). Begin with the "wild type" (i.e. unselected) population, and then repeat for each succeeding inbred generation.

Hypothesis:

Inbreeding should accomplish two things:

1. To generate homozygotes for genes conferring compatibility with the resistant-selecting host. This will happen rather quickly. Evidence to support this would come from comparing developmental patterns on the three different hosts. We expect that homozygotes will develop on their resistant-selecting host as well as they do on the susceptible host, but not on the resistant non-selecting host.

2. Genes for compatibility with the resistant-non-selecting host should sort out independently (unless they happen to be linked). Sorting out of these genes will be due to chance. The evidence for this should be seen in that some nematode lines will carry the genes and reproduce well on the resistant-non-selecting host while other lines will lose the ability to reproduce on these hosts. (We believe that in some combinations male development will not be affected, however).

Compare these results with SCN lines that have been developed through "Single Female Selection".

Hypothesis:

We believe that multiple mating is common in SCN and that the single female selection technique operates much like the "founder effect" genetists refer to. In other words the characteristics of the selected nematode lines are determined very much by the nematode you start with. Further selection on the resistant host will shift the gene frequencies in the populations to favor compatible combinations but we believe this will happen at a much slower rate than for true inbreeding. Also we doubt that single female selected lines will ever become completely homozygous and they will remain more variable.