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Evaluation of Soybean Lines Planted In Puerto Rico for Insect Resistance

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TRIP REPORT/PUERTO RICO

NAME: CHARLES G. HELM

TITLE: Assistant Supportive Scientist, Section of Economic Entomology, Illinois Natural History Survey

PERIOD OF TRAVEL: October 15--October 19, 1980

ITINERARY:

October	15	Champaign/Aguadilla, depart 7:30am, arrive 6:30pm
	16	Aguadilla
	17	Aguadilla
	18	Aguadilla
	19	Aguadilla/Champaign, depart 7:00am, arrive 6:30pm

PURPOSE:

Evaluate a planting of approximately 540 soybean lines for insect resistance. These lines were planted August 6, 1980 at the Isabela Substation, Isabela, Puerto Rico, by Mr. José Bravo. Lines to be evaluated included the following:

1. Maturity Group VIII - nearly 250 individual collections of PI's
2. Maturity Group IX - 100 individual PI's
3. Maturity Group X - over 100 individual PI's
4. Illinois lines - 28 advanced (F8) lines (Maturity Groups IV & V) previously screened for Mexican bean beetle and lepidopterous caterpillar resistance.
5. South Carolina lines - 52 advanced lines (Maturity Group VII and up) previously screened for Mexican bean beetle resistance.
6. North Carolina lines - 4 breeding lines.

The screening procedure is to include sampling the arthropod pest complex (species and numbers present), evaluating the degree of damage incurred by each individual line, noting the presence of diseases, and indicating various agronomic traits of lines when applicable.

ORGANIZATIONS AND PERSONS CONTACTED:

Isabela Substation, Isabela, Puerto Rico

Mr. José Bravo, Agronomist/Plant Breeder
Mr. Dan Erickson, UIUC, Assistant Agronomist

RESULTS/ACCOMPLISHMENTS:

Each line had been planted in a single row, approximately 20 feet long. Every 10th row, running through the entire plot, was a row of Phaseolus (snapbeans) which had been planted in an attempt to attract large numbers of defoliating insects to these plots. These rows were matured and had begun drying out. Surrounding the entire plot was a double row of cowpeas, flowering and setting pods. There was very little feeding on the cowpeas, but were large numbers of wasps attracted to the blossoms. The plot was relatively weed free.

Each row/line was swept with a standard 38 cm sweep-net; 4 sweeps per row, and counts of each important species were recorded. The primary defoliating species within these plots was Cerotoma ruficornis. Stink bugs were also numerous in some plots and counts of nymphs and adults were tallied for each plot. A wide range of species was encountered and samples of this complex were returned to Urbana for positive identification by Mr. John Bouseman of the Illinois Natural History Survey. The sugarcane root weevil, Diaprepes spp., was also found in a number of plots, although its numbers were very low and a final count was not reported. Adults of this weevil are very mobile and feeding was not evident. Leaf rolling caused by a lepidopterous caterpillar, most likely Hedylepta indicata (Lepidoptera: Pyralidae), was observed in most all of the lines. Lines with heavier than average leaf-rolling had up to or more than 20 leaf rolls per 10 plants. Samples of this species were not taken, but lines were rated as to degree of leaf-rolling.

A final species of interest, (although due to time constraints and numbers of plots, samples were not taken) was the limabean pod borer, Etiella zinckenella. According to Jose Bravo, many of his yield plots and increase plots were under heavy pressure from this insect and were receiving insecticide treatments on a regular basis. However, the plots for resistance evaluations were only slightly affected.

In most cases, numbers of insect per line were fairly low and thus not necessarily reflective of resistance or preference. Overall defoliation was also very low and fairly uniform, to the extent that individual plot estimates were not useful. In most plots defoliation was less than 5%, and in no case greater than 10%. This made evaluation on the basis of absolute percent defoliation very difficult, as the differences among lines were very subtle. Thus, as sweeps were taken, if an individual line appeared more heavily defoliated than average, it was given a - rating; if less defoliated than average, it received a + rating. The same system of records was used for the degree of leaf rolling. Additional notes on plant growth stage, the presence of disease, and various other comments were recorded this first time through the plots.

After the initial sweep of the plots for insects and impressions on defoliation and leaf rolling was completed, this information was put aside and a second check was made. This, then, was totally blind of the first check, and only + or - ratings were recorded for defoliation and leaf rolling. These two sets of records were then combined. If, on both times through, a line was noted by a + or -, these were combined to give a ++ or -- rating. Hopefully, this indicates a very real difference in this line from all the others.

Total numbers of lines selected from each group:

Groups	Defoliation				Leaf Rolling			
	+	++	-	--	+	++	-	--
Maturity Group VIII	10	2	23	1	2	0	18	5
Maturity Group IX	14	3	0	1	2	0	13	2
Maturity Group X	12	6	9	5	0	0	7	0
Illinois Lines	(very little defoliation)				1	0	5	0
South Carolina Lines	1	0	1	0	3	0	4	1
North Carolina Lines	(very little defoliation)				3	1	0	0

FOLLOW-UP ACTION:

1. Detailed data sheets, tallied from field notes and including insect counts, defoliation ratings, plant growth stage, disease incidence, and notations on agronomic traits, have been compiled and forwarded to both Dr. Marcos Kogan and José Bravo. I was able to meet with José Bravo at the recent INTSOY retreat, held in Urbana, November 5-7. Additional copies of this information are available.

2. Alcohol-preserved specimens of insects collected in the plots were returned to Urbana for identification by Mr. John Bouseman where necessary. Of particular interest to Mr. Bouseman is the stink bug complex. IRCSA data sheets have been compiled and these specimens will be entered in the reference collection.