2003 Sap Beetle Research Report

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Background Dusky sap beetles are a significant concern to commercial sweet corn growers in western Colorado. Olathe Colorado grown and marketed sweet corn has been developed with a reputation for high quality, and sap beetles contaminate the product. A research program was initiated in 2002 to develop a research based management program to keep sap beetle contamination at low levels without increasing production costs and insecticide use. The 2003 Sap beetle research program in western Colorado was funded by a $10,00 grant to Olathe Spray Service from the CSU Specialty Crop Grower Grant Program, $2500 from Colorado West Sweet Corn Market Order to Tri River Cooperative Extension, and $2000 from Syngenta Corporation.

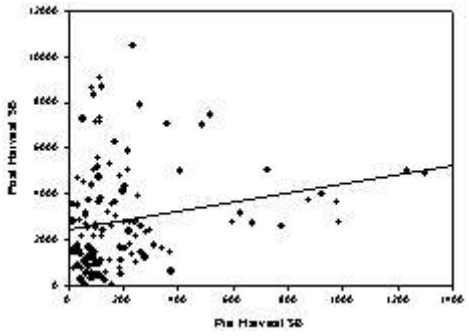
This preliminary report will be discussed at a meeting of sweet corn growers, field men, production companies, and aerial applicators in January 2004. The report will be finalized after the input from individuals attending that meeting. A final report will be presented at the Tri River Ag Production Workshop in Delta on February 5, 2004.

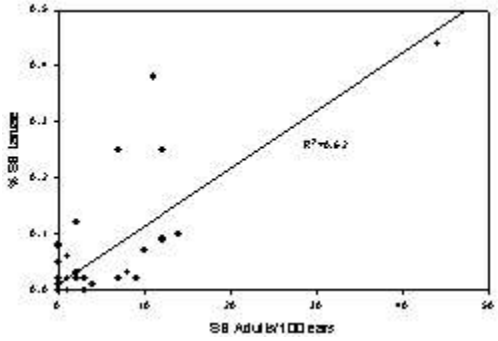
2003 Research Program Methods Dusky sap beetle pheromone traps were placed at all fields serviced by Olathe Spray Service in 2003. Traps were placed in the field at first silk and changed weekly until the end of September. In addition, approximately 45 sweet corn fields were sampled for sap beetles and corn earworm at harvest by entering the field near the trap and collecting 100 random ears. Total sap beetle adults, percent sap beetle larval infestation and percent corn earworm infestation were determined. Data was collected on cultural and agronomic parameters for each field. Selected comparisons, correlations, regressions and observations were made in attempt to discover the reasons for sap beetle problems and how to manage them in sweet corn.

Selected Conclusions:

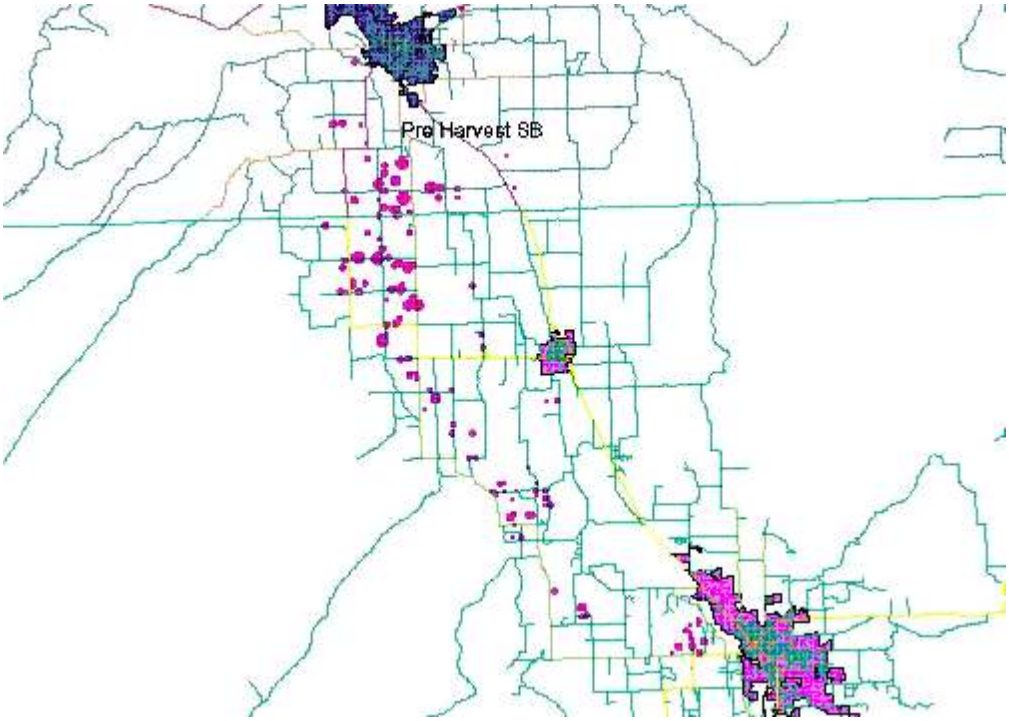
1) Sap beetle traps are good for capturing sap beetles. They are not good for predicting problems within a field.

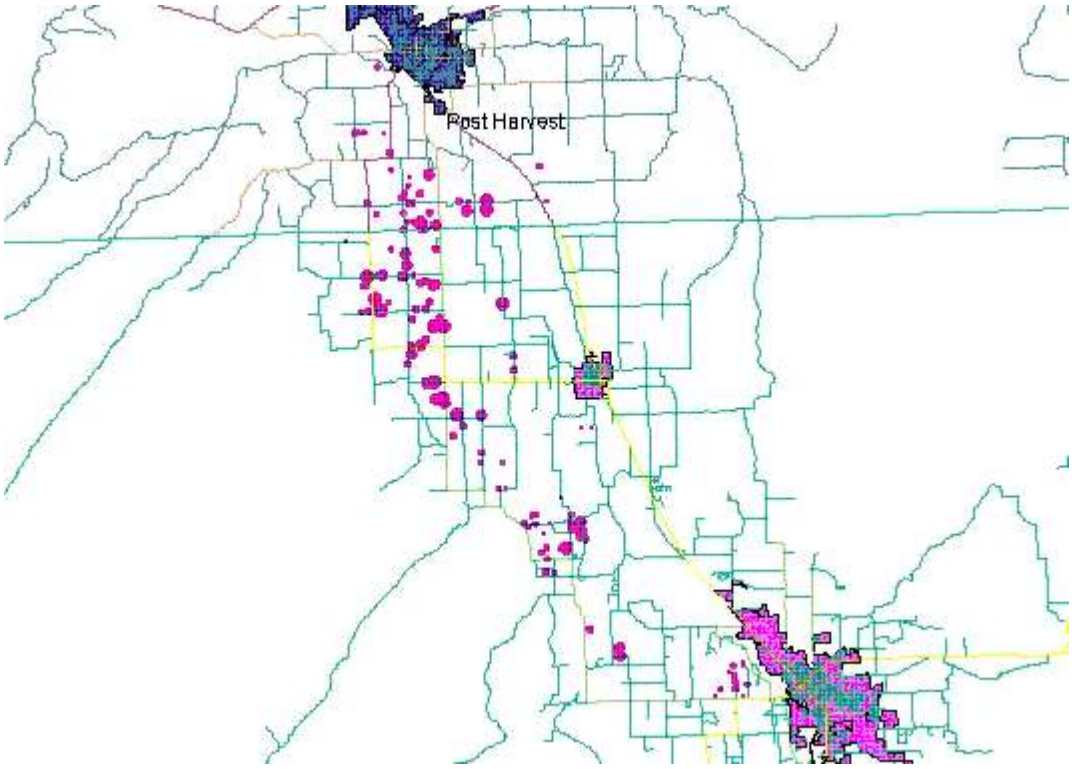
2) Trapped sap beetles did not originate within sweet corn fields. There was no correlation between pre and post harvest captures. Field corn is a likely source of late season captures.



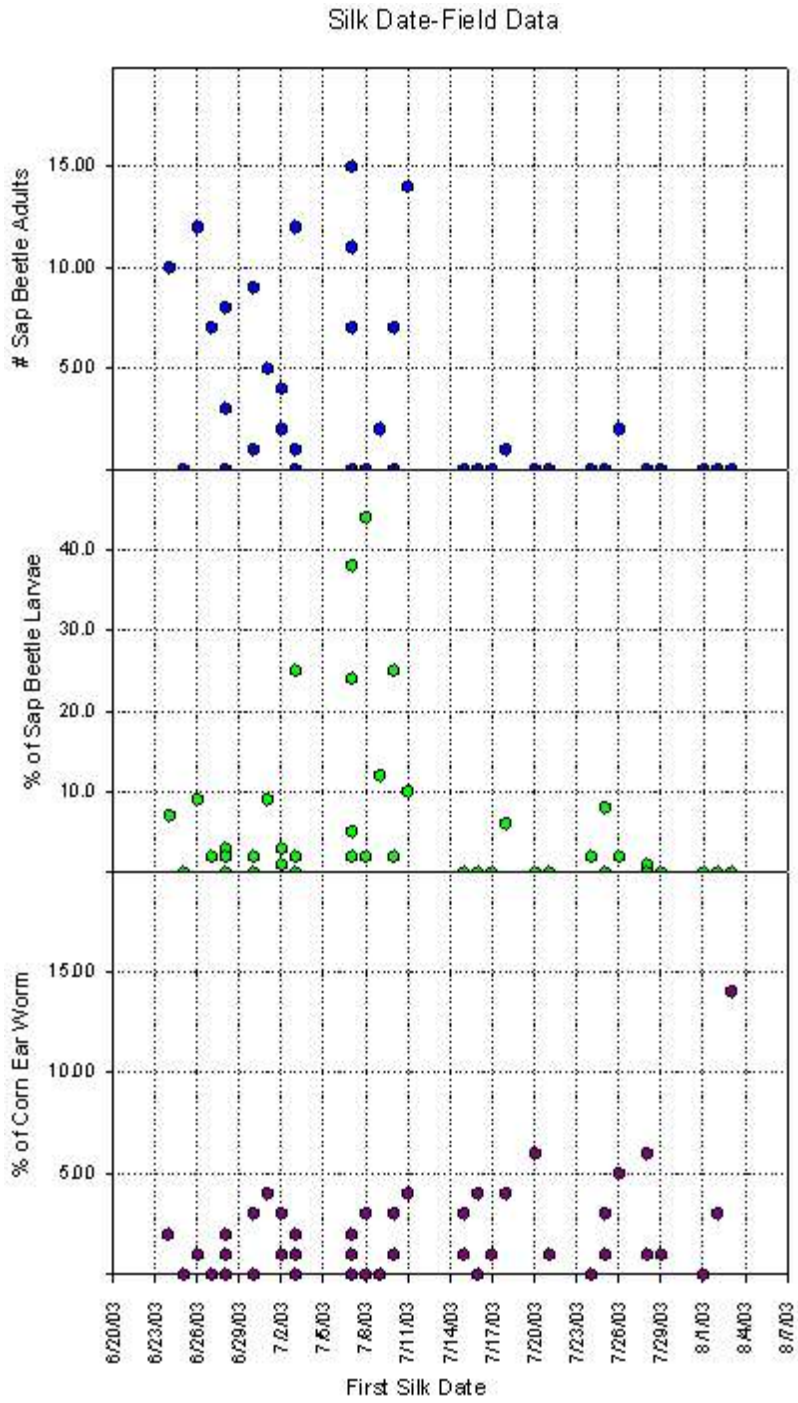


3) California Mesa is a pre harvest sap beetle (trap count, top map) hot spot . Post harvest trap counts (bottom map) are also high on High Mesa and near Four Mile Corner. Field corn, elm trees and cropping diversity are likely sources of late season beetles. The size of the data point is indicative of the relative sap beetle capture.

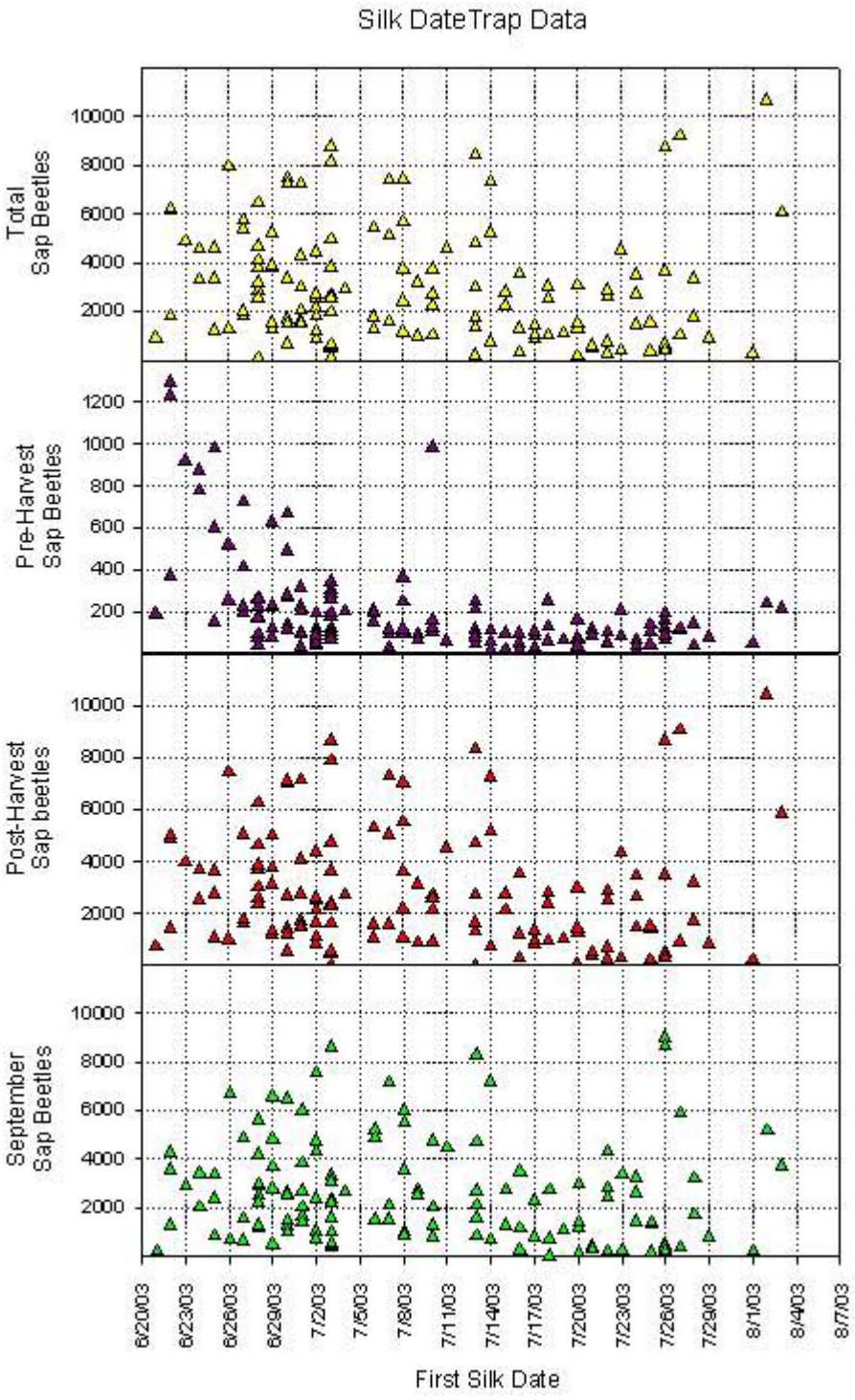




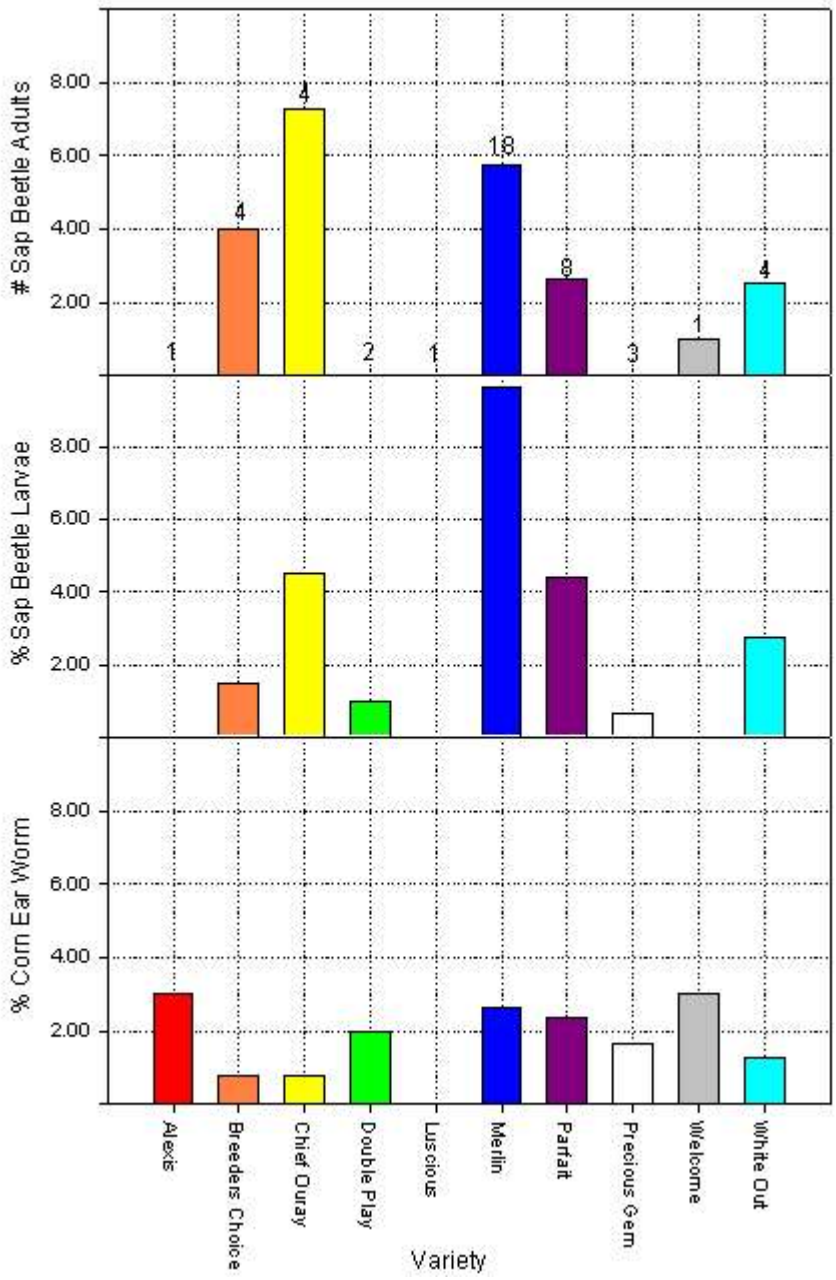
4) Sap beetle infestations (SB adults/100 ears, %larvae infested ears) were greatest in fields that silked before July 11. These fields were harvest ready in early August, and ears became attractive to sap beetles at the same time as pollen fall in nearby field corn. Field corn was competitive enough to attract significant numbers of sap beetles from sweet corn.



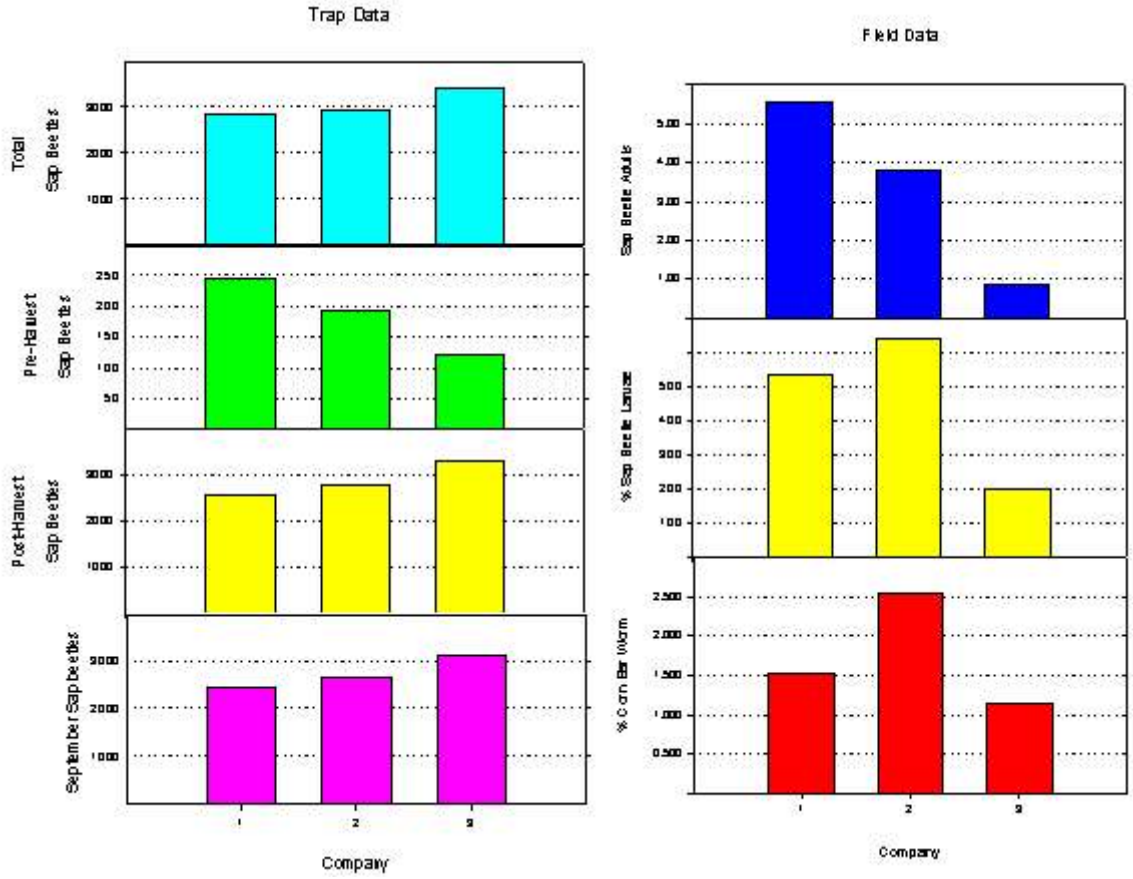
5) Pre harvest SB trap captures dropped significantly in fields that silked after July 1. The reason for the 10 day discrepancy in silk dates between trap captures and field counts in unknown.

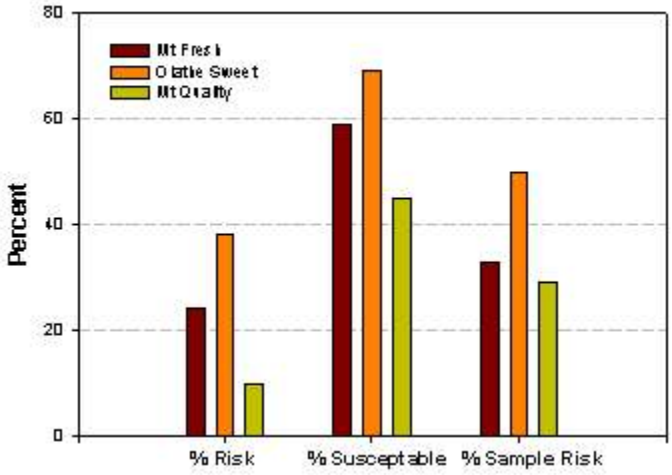


6) Merlin, Parfait, Chief Ouray and possibly White Out were the varieties with the most consistent problem of larval contamination. Merlin is the greatest problem variety - it is the most commonly grown variety. Numbers in top bar graphs indicate the number of fields in the sample.

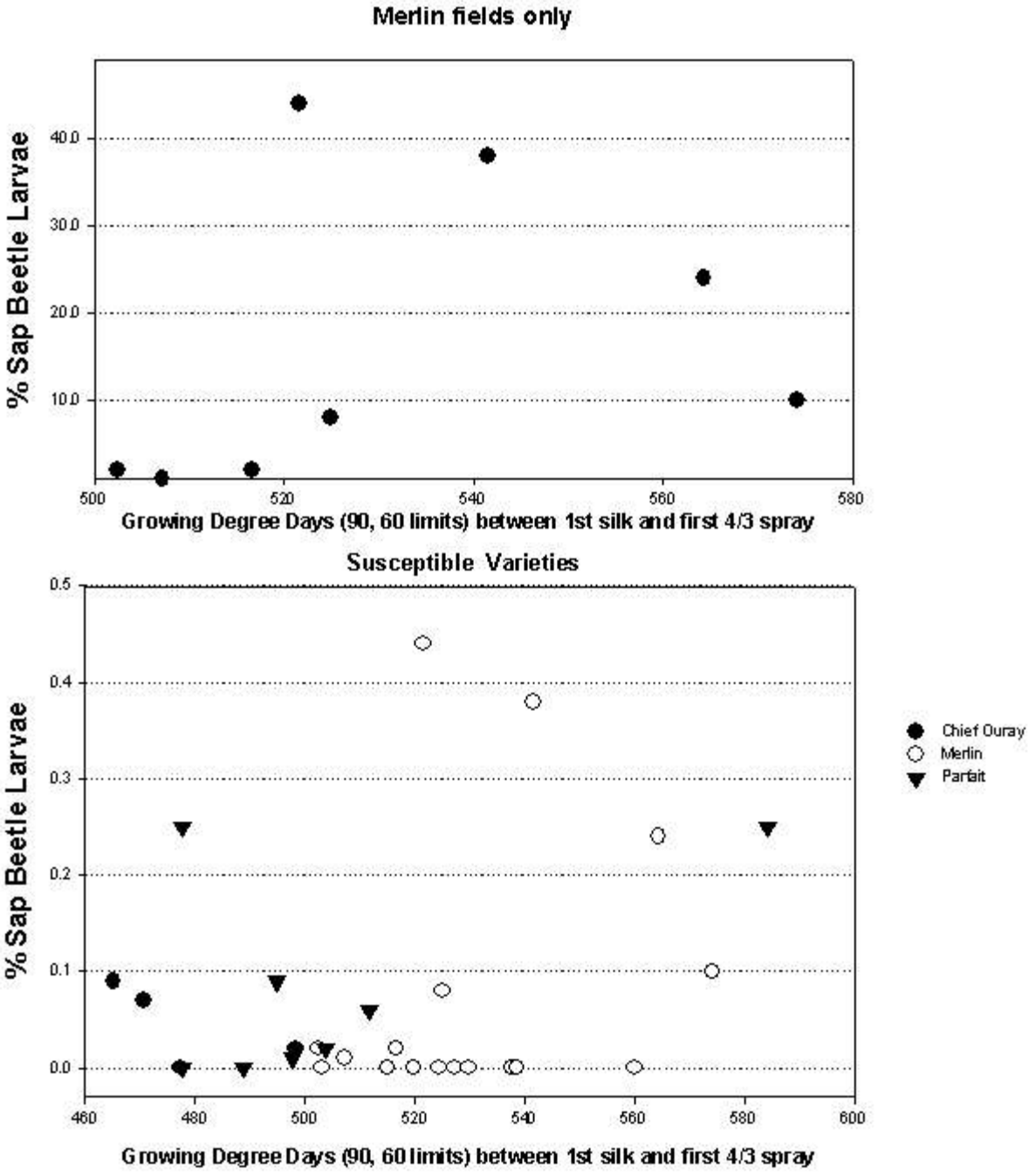


7) There were differences between production/marketing companies in sap beetle infestations. These are due to companies growing differing percentages of susceptible varieties during the critical time period prior to July 11 (bottom graph). Risk was defined as susceptible varieties (Merlin, Chief Ouray, Parfait, White Out) that silked before July 11. % sample risk was calculated only from those fields were sampled for sap beetles.





8) Accumulated heat units were calculated (90, 60 degree F limits) from the Olathe COAGMET weather station. Degree days were calculated from first silk until the initiation of the 4/3 spray schedule. Problems in Merlin fields were in fields in which the spray program began after 520 DD. Parfait problem fields began after 480 DD. The 4/3 spray program should begin based on degree day accumulation from first silk. The total accumulation will be variety specific, and will be based on future research.



Recommendations

High risk fields can be predicted: Susceptible varieties (Merlin, Parfait, Chief Ouray, White Out); First silk before July 11; Problem areas (California Mesa> 4 Mile corner, High Mesa, Coal Creek> Montrose, Mesa County).

1) Use more tolerant varieties for early season sweet corn that silks before July 1. Merlin should be an August maturing variety. Earlier fields of susceptible varieties should be grown in areas of lower SB pressure

2) The sap beetle portion of the spray program should be initiated using a heat unit accumulation key. The initiation should be earlier in high risk fields and areas.

3) SB pheromone traps are not useful for gathering useful infestation on SB potential. The preferred method will be to count SB adults within a field beginning about two weeks before harvest.

4) Timely harvest after the conclusion of the spray schedule is critical. A realistic harvest date should be set, and the spray schedule continued until at least 3 days before harvest.