RESEARCH REPORT TO:
THE AGRICULTURAL RESEARCH FOUNDATION
FOR 1999 TO 2000

TITLE: ***Regional Pest Monitoring Program***

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PROJECT STATUS: Completed
PROJECT FUNDING: $5,400

This proposal is also submitted to the broccoli, cauliflower, and sweet corn research committees of the Oregon Processed Vegetable Commission

OBJECTIVES:

To maintain, evaluate, and refine a regional pest monitoring network for selected Lepidopteran pests of broccoli, cauliflower, and sweet corn.

To strengthen the communication network among ag professionals serving the Willamette Valley processed vegetable industry.

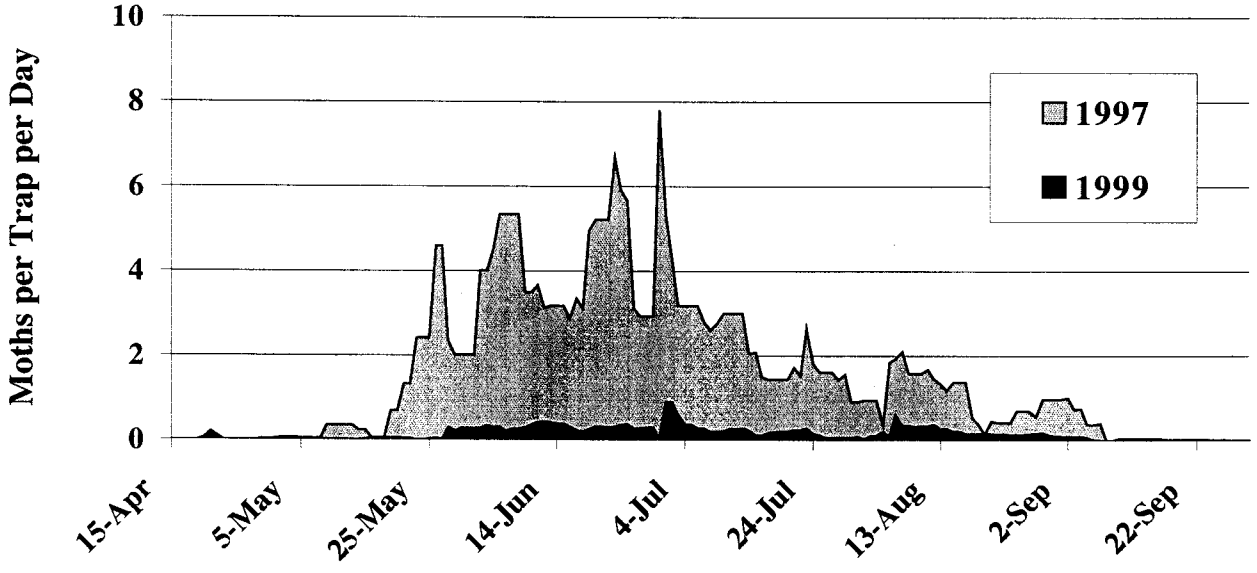
PROJECT PROGRESS REPORT:

Insect pest populations in corn, beans, and cole crops vary a great deal from year to year. Following an insect population outbreak year, growers and industry field representatives adopt conservative spray programs. Soil insecticides are applied at sweet corn planting to protect corn from black cutworm, insecticides are combined with fungicide sprays on snap beans at blossoming to protect pin beans from damage by 12-spot beetle, and insecticides are applied on buttoning broccoli several weeks prior to the normal preharvest clean up sprays to protect cole crops from Lepidoptera larvae regardless of insect population dynamics. In outbreak years, these conservative spray programs are justified, however, outbreak years occur every three to five years. In non outbreak years, fewer insecticide applications are needed. If we could detect outbreak versus normal years, we could save 15 to 25 dollars per acre on our vegetable plantings by eliminating unneeded insecticide sprays.

Methods: Pheromone and yellow sticky traps were established on 20 vegetable production farms around the Willamette Valley and monitored on a weekly basis. Several growers established insecticide free strips in sweet corn plantings; crop damange and insect trap counts were compared. Regional and local insect population trends were reported to 150 agriculture field representitives and farmers by broadcast fax. Insect contaminants of harvested broccoli were collected on a weekly basis from a local food processing plant. Grower cooperators included:

Buck Spry, *Gaston*
David Egger, *Suavie Island*
Richard Haener, *Aurora*
Ron Smith, *Donald*
Jim Landrith, *Keizer*
Keith Grover, *Keizer*
Gary Cook, *Dever-Conner*
Carl Hendricks, *Stayton/Scio*
Phil Janzen, *Hopewell*
Cliff Horning, *Monroe*
David Duyck, *Forest Grove*
Joe + Marue Gadotti, *Scappose*
Mike and Del Haener, *Donald*
Mark + Mike Dickmen, *Mt Angel*
Larry + Ron Pearmine, *Gervais*
Obersinner Farms, *Howell Prairie*
Peter Kenagy, *Albany*
Skip Gray, *Dever-Conner*
Tom Sweeney, *Dayton*
Gordon Hentze, *Junction City*

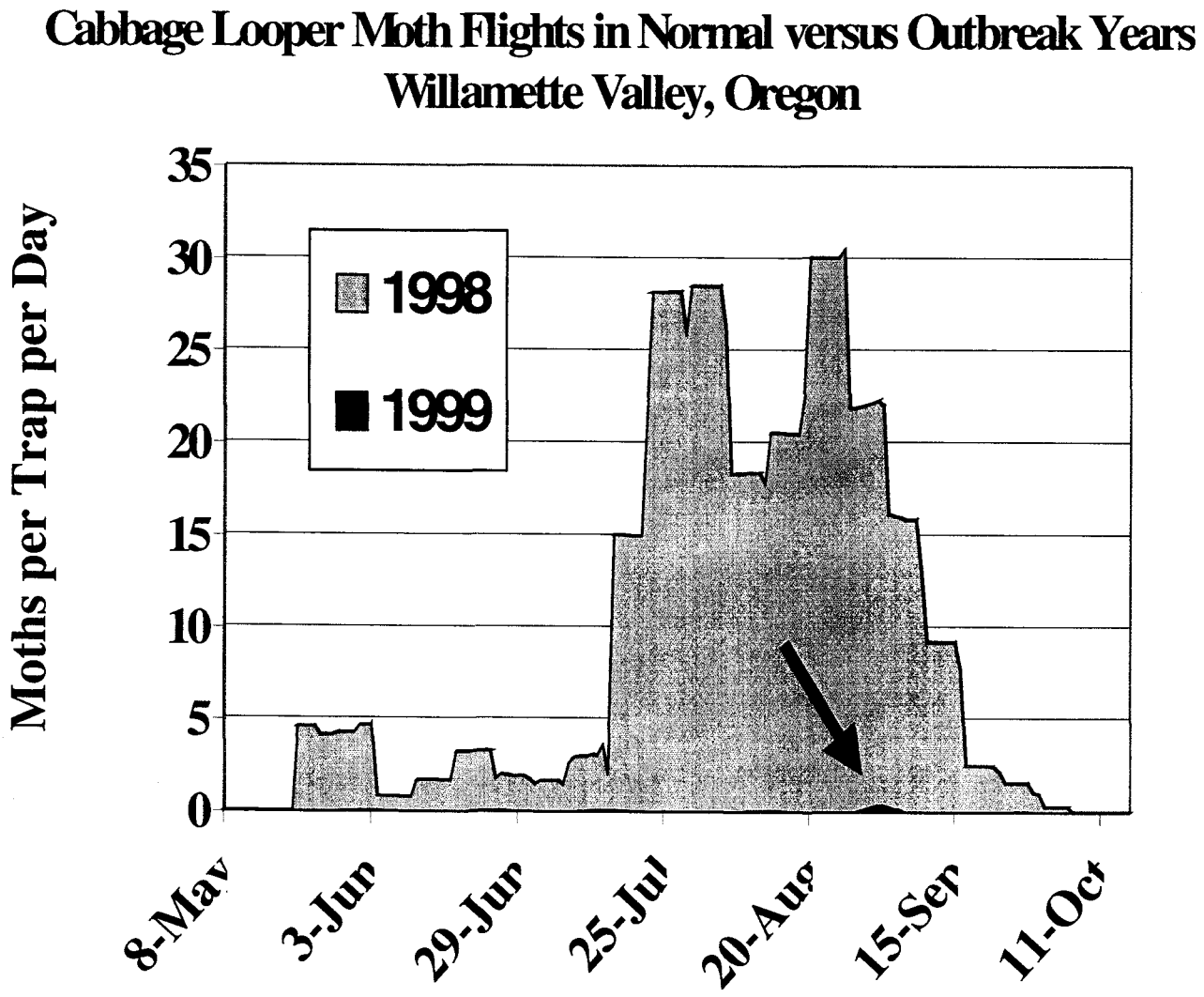
Black Cutworm Moth Counts in Normal vs Outbreak Years
Willamette Valley, Oregon

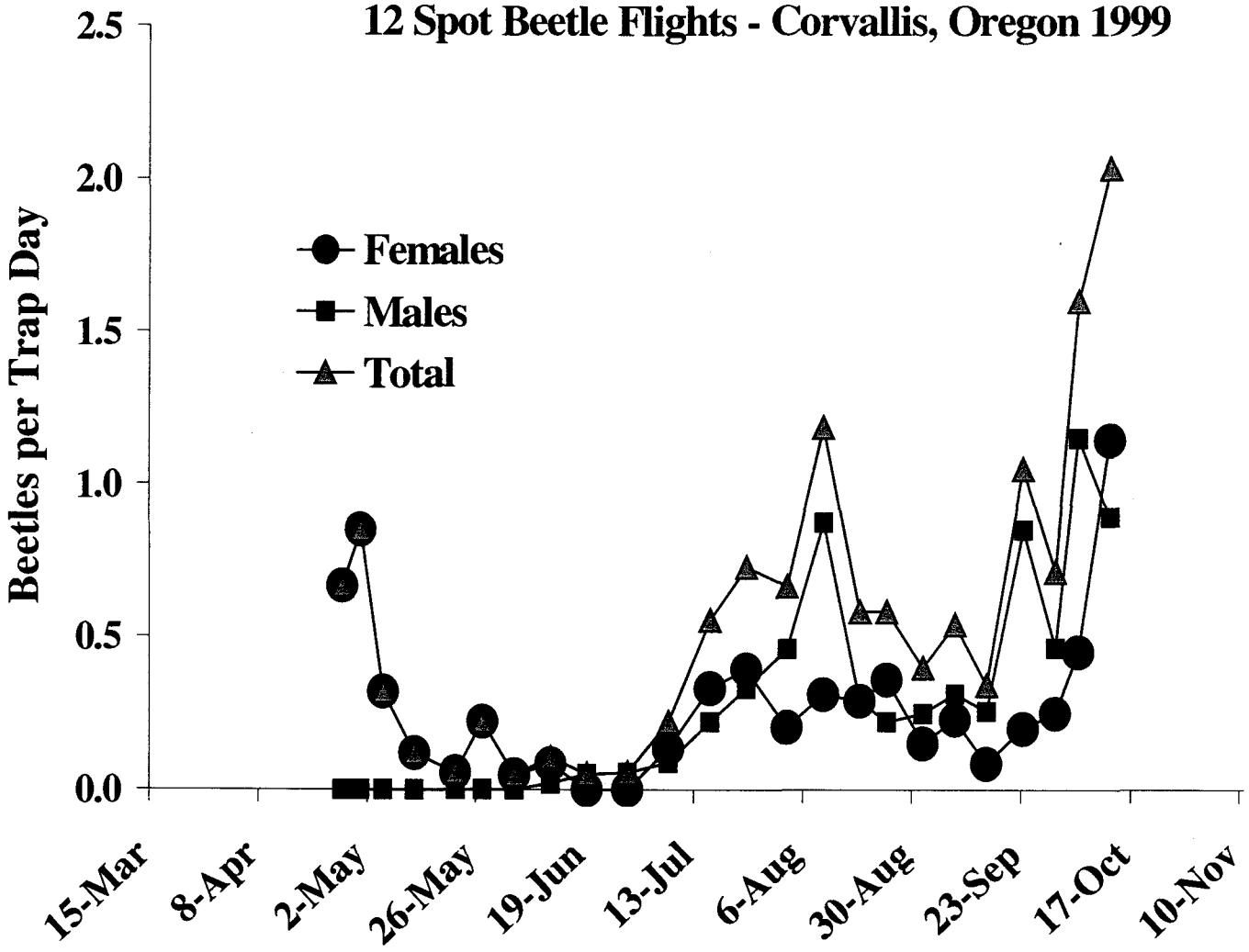


Results: Populations of black cutworm during the 1999 growing season were low compared to the last outbreak year in 1997 (Figure One). Black cutworm moth counts per trap day rarely exceeded 1.5 moths per trap per day. Stand loss in the insecticide free sweet corn strips never exceeded five plants per thousand.

Results: Populations of cabbage looper during the 1999 growing season were markedly lower than in 1998 (Figure Two). Moth counts never exceeded 0.5 moths per trap day. No broccoli growers in the Willamette Valley reported serious problems with insect contamination in 1999.

In 1998, approximately 750 larvae and pupae of cabbage looper, cabbage butterfly, diamondback moth and bertha army worm were found during the quality assurance testing of processed broccoli at the cooperating processing plant. In 1999, two larvae were found on broccoli in the processing plant during the entire growing season.





Results During the early planting season, only gravid (egg bearing) female 12-spot beetles were observed (Figure Three). The gravid female beetles over winter and then produce the first generations of corn root worms in the early spring. Adult beetle counts dropped very low in mid June as eggs were deposited on the soil and the larvae matured on plant roots (including sweet corn). This first cohort of beetles pupated in the soil and emerged as a second generation of adult beetles in mid August. This cohort of beetles had a normal (1:1) sex ratio. In mid September, there was a second drop in adult beetle counts, followed by what appeared to be the emergence of a second generation in mid October. This generation presumably will overwinter as gravid females and produce the first generation of the 2000 growing season. Although future research is needed to verify this phenology, the 1999 results suggest that 12-spot beetle pressure varies significantly

during the course of a single growing season; some sweet corn and snap bean planting periods are low risk for beetle damage.

Conclusion: Key insect pests of sweet corn, beans, and cole crops in the Willamette Valley have distinct seasonal activilty cycles. As a result, there are periods of high and low risk of crop damage during the course of the growing season in a normal year. These insect pest populations vary dramatically from one year to the next. Worm counts in the processing plants reflect year to year changes in insect pressure. During an outbreak year, a conservative spray program is justified.

We now have enough historical information to interpret insect trap counts for a growing number of insect pests. We can detect outbreak years on a regional and local basis. During a normal or below average year, we should be able to use less conservative spray programs. In very low risk sweet corn plantings, we could save 15-25 dollars per acre on soil applied insecticides. In very low risk bean plantings, we could money on unneeded insecticides applied at blossom time. In low risk cole crop plantings, we could eliminate preemptive insecticide sprays and use the normal preharvest clean up spray program. Future studies are needed to confirm the relationship between regional and local insect trap counts and plant damage in insecticide free plantings. In time, we are opptomistic that insect pest population monitoring will be accepted and a useful compliment to field scouting in sweet corn, snap beans, and cole crops.