Section III
Biological & Cultural Control

OREGON CEREAL LEAF BEETLE BIOLOGICAL CONTROL PROGRAM, 2004

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Introduction

Cereal leaf beetle, *Oulema melanopus* (CLB), was first identified in Michigan in 1962 as an introduced pest from Europe. It spread to many states east of the Mississippi River and by the early 1990's, the pest was found in four western states – Wyoming, Montana, Utah and Idaho. Oregon first found CLB in 1999 in Malheur County. A statewide survey for CLB continued for a sixth year in 2004. CLB was not found in any new counties in 2004. To date, CLB has been detected in 19 counties: Benton, Clackamas, Columbia, Lane, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill in western Oregon and Baker, Crook, Deschutes, Jefferson, Malheur, Umatilla, Union, and Wallowa in central and eastern Oregon.

Biological control has been effective in the eastern US where the invasive beetle first caused serious damage. The biological control program for CLB in Oregon began immediately after its detection in 1999 with field releases of parasitoids in growers' fields from 1999 through 2003. Through USDA funding, administered by ODA, a specialty crop grant from the Oregon Hay and Forage Association was awarded to continue the bio-control program by starting two field insectaries in 2002 with the long term goal of rearing and redistributing CLB biocontrol agents within the state. In 2004, we continued work in a three-year old insectary near Banks in Washington County, which was started for the rearing of *Anaphes flavipes*, a CLB egg parasitoid. A second insectary for *A. flavipes* was started near Scholls in 2004 so that releases could be made there without interfering with recovery efforts at the Banks insectary. We also monitored a second, three-year old insectary, started in cooperation with OSU at the research station in Union County, for *Tetrastichus julis*, a larval parasitoid of CLB. In 2003 a third insectary, also for *T. julis,* was established at the OSU research station near Vale in Malheur County. Unfortunately, the insectary was moved after only one year to a private grower's field in Ontario in 2004. Also in 2004, two new volunteer insectaries were started for rearing *T. julis*, one at the OSU Hyslop Farm research station near Corvallis in Benton Co. and the other near Madras in Jefferson Co.

The egg parasitoid – *Anaphes flavipes*

An estimated 26,213 *A. flavipes* were released into the new insectary in Scholls. As in 2003, most of the *A. flavipes* wasps received from the APHIS-Niles biocontrol lab in Michigan were released as parasitized CLB eggs on picked oat leaves and placed with a sponge inside small, modified paper milk cartons mounted on wooden stakes in the field. The rest were released as parasitized CLB eggs in small petri dishes inside the same carton and stake assembly. About 7,000 adult CLB were also released into the insectary to augment CLB egg density.

This year marked our first true recovery (successful overwintering) of *A. flavipes* from the Banks insectary after two years of releases. The field, which was again planted to winter wheat and

spring oats, was closely monitored and CLB eggs were collected and tested on a regular basis for presence of *Anaphes* wasps. Early development of *A. flavipes*, particularly the red eye stage, can be viewed through the side of the CLB egg. Also, an additional 8,500 CLB adults were released to increase egg numbers. *A. flavipes* was detected in 6 out of 16 samples collected. The parasitism rate (PR) ranged between 1.5% to 50% with an average of 21.3%.

The larval parasitoid – *Tetrastichus julis*

CLB larvae, parasitized by *T. julis*, were released in two counties, and only in the insectary fields (estimated numbers released): Benton (45,066) and Malheur (5,628). Parasitized CLB larvae were acquired from Pennsylvania (7,927), Wyoming (2,500), and Montana (2,275). The parasitism rates among CLB larvae from those states, ranged from about 20% to 100%. Additional CLB larvae and adults collected from Union County were also released into the *T. julis* insectaries in Ontario (900), Madras (2,900), and Corvallis (5,000) in an effort to augment CLB populations in those fields.

There was widespread recovery of *T. julis* from nearly all places where it had been previously released and numbers were exceptionally high in a few locations. An early, warm spring and early season spraying kept the number of CLB larvae low in production fields in Malheur County in 2004. A small number of recovery samples were taken in the area and the PR was still at a low 1.5%. The Union County insectary was left alone after 2003 to let *T. julis* numbers increase naturally. Collections there indicated that the PR was still low, ranging from 2.3 to 5%. However, other previous release sites in private grower fields near La Grande yielded an outstanding PR of 77% in one location and 50% in another. Similarly, Baker County had a high PR of 72% in one location. This year also marked the recovery of *T. julis* in western Oregon in Multnomah County on Sauvie Island, where releases have been made since 2000. It was collected from two locations where the PR ranged from 1.8 to 11.4%.

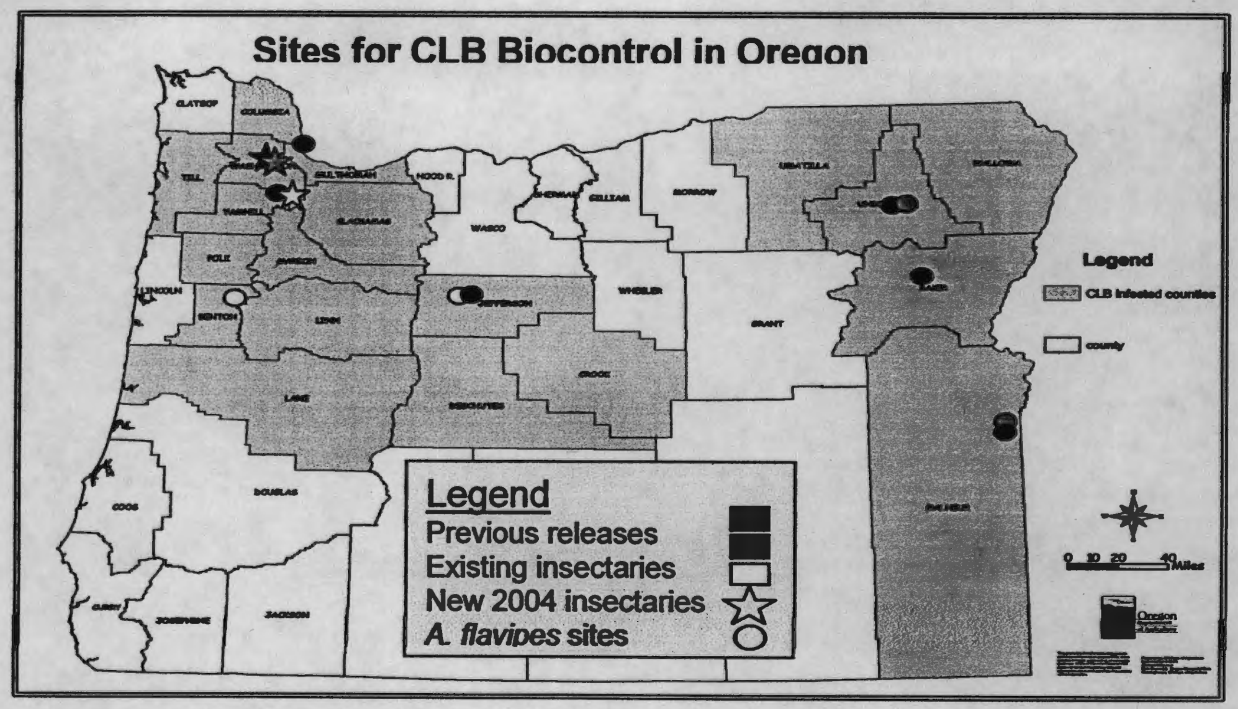
Pesticide use

Successful biological control is needed for a healthier farm and landscape environment. A pesticide warehouse survey by USDA in 2003 indicated that insecticide-treated acreage for CLB in Oregon had dramatically increased from none in 1999, to 1,390 acres in 2000, 12,217 acres in 2001, 26,703 acres in 2002, and 38,309 acres in 2003. The number jumped to 64,200 acres in 2004.

Conclusions

All of the pyrethroid treatments applied with the transplant fertilizers in large scale plots provided control of garden centipedes in transplanted tomato fields with a history of extensive damage. These materials are currently registered for use in tomatoes. The lack of damage in the untreated control plots this year prevents us from analyzing these results. While in the past three years we have been able to treat small areas in the middle of large problem spots and show differences, it is not understood why we were not able to treat large areas and show differences in small untreated sections.

The thorough incorporation of these pyrethroids prior to transplanting with a rototiller was very effective in the small plots, as in previous year's research trials.


Sites for CLB Biocontrol in Oregon
Legend
Previous releases
Existing insectaries
New 2004 insectaries
A. flavipes sites
Legend
CLB infested counties
county
0 10 20 40 Miles