

Section III

Biological & Cultural Control

Cereal leaf Beetle Biological control program in Oregon, 2006

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Introduction

Cereal leaf beetle, *Oulema melanopus* (CLB), was first identified in Michigan in 1962 as an introduced pest from Europe. Oregon first found CLB in 1999 in Malheur County. A statewide survey (Fig. 1) did not detect CLB in any previously uninfested counties in 2006. To date, CLB has been detected in 19 counties: Baker, Benton, Clackamas, Columbia, Crook, Deschutes, Jefferson, Lane, Linn, Malheur, Marion, Multnomah, Polk, Tillamook, Umatilla, Union, Wallowa, Washington, and Yamhill.

The cornerstone of CLB management is biological control which has been effective in the eastern US where CLB first caused serious damage in North America. The cooperative biological control program among ODA, USDA, and OSU for CLB in Oregon began immediately after its detection in 1999. In 2006, the program continued to monitor, release, and redistribute the two parasitoid species, *Anaphes flavipes* and *Tetrastichus julis*, in many CLB infested counties in Oregon.

Egg parasitoid – *Anaphes flavipes*

The two insectaries for the egg parasitoid, *Anaphes flavipes*, in Washington County were monitored for natural population changes. The wasp was established in both insectary fields after two years of releases. Releases were made at the Banks insectary in 2002 and 2003 and the site has been monitored each year since then. Although the parasitism rate peaked in late June to early July at about 30% in 2005, all efforts to recover the wasp failed in 2006. Recovery efforts were also made at the Scholls insectary site where releases of *A. flavipes* had been made during 2004 and 2005 and within-season recovery was achieved in 2005. Monitoring of the Scholls site during 2006 yielded our first overwintering recovery there, but only from one collection in mid-June with a parasitism rate (PR) of approximately 5%. Discussions with colleagues in Montana suggest that populations may not stabilize or even increase until a minimum of 5 years after release. Due to very low CLB levels and lack of other resources, there were no release or monitoring activities at the OSU Agricultural Research Center insectary site in Union County where *A. flavipes* was released in 2005. Hopefully monitoring eggs for parasitoid establishment can begin in 2007. All releases of *A. flavipes* in 2006 were made in a new location in a grower's field in Scio, Linn County. An estimated 16,750 *A. flavipes* were released at the Scio field. Releases were made there so as not to interfere with recovery efforts in the Washington County insectaries and to start moving the egg parasitoid to other CLB infested areas in the state. Figure 2 shows *A. flavipes* activity sites.

The source for the *A. flavipes* releases was the Colorado Department of Agriculture's biocontrol facility in Palisade, Colorado. Oregon sent 18,316 adult CLB to Colorado to help support the lab colony. As in previous years, the *A. flavipes* wasps were released in parasitized CLB eggs on oat leaves and placed with a sponge inside small, modified paper milk cartons mounted on wooden stakes in the field.

Larval parasitoid – *Tetrastichus julis*

The main goals for the *T. julis* program in 2006 were to determine the distribution of *T. julis* in western infested counties, to track the phenology of *T. julis* in western Oregon for accurately timing collections of parasitoids, and to continue to collect and redistribute *T. julis* to more recently infested areas, such as central Oregon.

An unexpected discovery in 2005 of *T. julis* in Linn County, where it had never been released before, suggested that the parasitoid had spread naturally through parts of western Oregon. To determine *T. julis*' current distribution, several grain field sites throughout the Willamette Valley not previously used for *T. julis* releases, in addition to previous release sites, were sampled for CLB larvae. Larvae were collected approximately biweekly and brought to the lab in Salem for dissection and parasitism assessment. Widespread recovery of *T. julis* was found in 2006 with exceptionally high PRs, even in some locations where it had not been previously released. The peak PRs of *T. julis* found in each CLB-positive county were as follows: Benton (100%), Clackamas (84%), Jefferson (2%), Lane (76%), Linn (100%), Multnomah (67%), Union (98%), Washington (100%), Yamhill (100%).

An effort was also made to examine *T. julis* phenology and PRs changes over time. CLB larvae were collected weekly from three sites each in three different counties known to have high PRs for *T. julis*. Larvae were dissected to determine PR. Results generally showed a maximum PR of approximately 50% around mid to late May, a drop to near zero in early June, and a second PR peak of 100% in mid to late June. This data suggests that the first half of June is a poor time to collect CLB larvae for redistribution of *T. julis*, even from known, heavily parasitized fields.

Two of three field insectaries for *T. julis* were active in 2006. OSU's insectary field at the Central Oregon Agricultural Research Center in Madras, Jefferson County, was the only one that received *T. julis* for release. The Madras insectary had CLB numbers too low to release *T. julis* in 2005. Additional adult CLB and larvae with *T. julis* were released in the insectary field. Larvae with *T. julis* were also released in a few local growers' fields. Due to recovery success and an already high parasitism rate, no *T. julis* releases were made at the Hyslop insectary field, although adult CLB were added to the site to boost CLB numbers for the parasitoids. Due to very low CLB levels and lack of other resources, there was no activity at the OSU Agricultural Research Center insectary site in Union County. This insectary will likely be discontinued in 2007 due to the widespread success of *T. julis* in Union and Baker counties.

High PRs in some areas made 2006 the first year that *T. julis* was collected entirely from within Oregon and moved for redistribution. In addition to the releases in Central Oregon and a few small releases into Linn and Union counties, 2006 marked the first year for *T. julis* release into Umatilla County. *T. julis* were released in four counties in 2006. The number of CLB larvae (and

estimated number of *T. julis*) released in each county are: Jefferson, 4,750 (20,500); Linn, 1,000 (4,800); Umatilla, 3,500 (16,425); Union, 50 (240). The parasitism rates among CLB release material from all areas, ranged from 28% to 98%. *T. julis* activity sites are shown in Figure 3.

Successful biological control is needed for a healthier farm and landscape environment. A pesticide warehouse survey by USDA in 2005 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, 38,309 acres in 2003, and 64,200 acres in 2004 but had gone down slightly in 2005 to 50,175 acres due to reduced grain acreage. Results are not yet available for 2006.

Figure 1

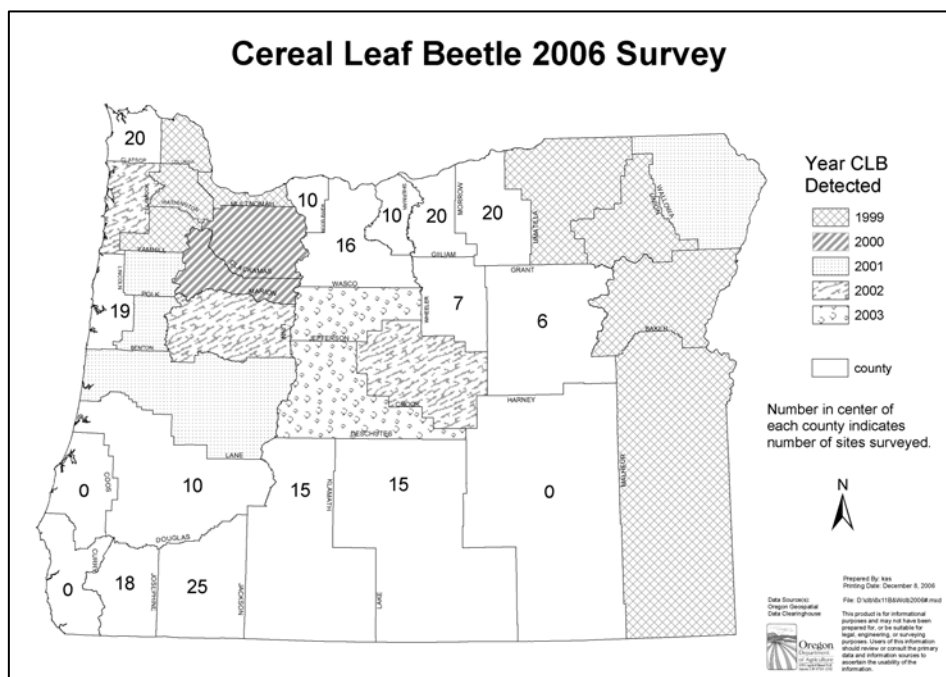


Figure 2

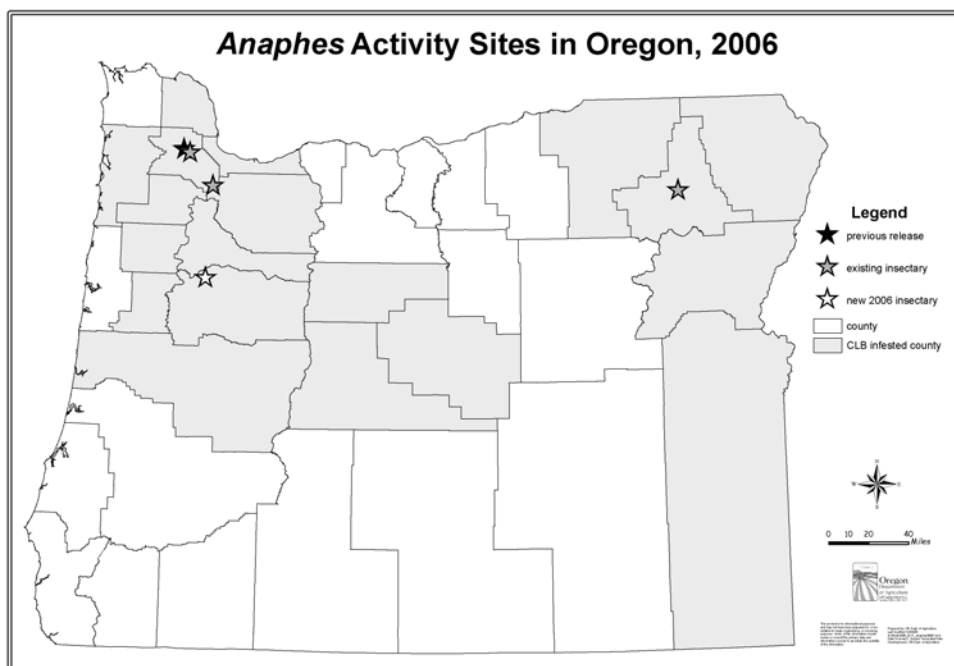


Figure 3

