

Section IV  
Cereal Crop Pests

DISTRIBUTION AND PHENOLOGY OF THE CEREAL LEAF BEETLE,  
*Oulema melanopus* (L.) (COLEOPTERA:CHRYSOMELIDAE) IN OREGON

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**Introduction**

The purpose of this study was to monitor the continuous spread and population levels of CLB and to determine its phenology in Oregon. The information gained will clarify quarantine issues and aid us in developing continuing biological control programs.

**Methods** We monitored the spread of CLB using the generally accepted protocols of the Western States workgroup, by surveying the counties found negative during previous years. Our goal was to survey a maximum of 20 fields, preferably production fields with oats, wheat, or barley, distributed evenly in each county. Alternate sites included grass-seed fields, pastureland, and rangeland. Where possible, irrigated fields were selected. In counties where fields were not available, a variety of tall roadside grasses were surveyed. A total of 120 sweeps (4 sets of 30) with a 15" insect sweep net were done at each survey site. Technicians looked for both larvae and adults from each sweep sample.

The phenology and population studies initiated in 2000 were continued for a third and final year in 2002. Because of apparent climatic differences between the east and west sides of the Cascade Mountains, we suspect that CLB's phenology may differ between the two regions in the state. We conducted weekly samplings of CLB in four infested counties, two on the east side of the mountains (Union, Malheur) and two on the west (Multnomah, Washington). Four CLB positive fields per county, two each containing winter wheat and two with spring crops of oats, wheat or barley were chosen for sampling. To maximize phenological data, weekly sampling began in winter wheat fields in the spring at the first sign of adults or adult damage. Spring grain fields were checked and sampled as soon as seedlings sprouted. All fields were sampled for all life stages throughout the season. Sweep nets were used to sample adults. Eggs and larvae were quadrat sampled by dividing a field, or a rectangular portion of a very large field, into 9 subplots. Within each subplot, a random sample was taken using a 1/2 meter sq quadrat tossed into the field. Usually a quadrat enclosed 3 to 4 rows of grain, 1/2 meter each. Because of many grain stems in a quadrat, we chose to sample CLB from just one row. All CLB life stages on stems in one 1/2 meter row were visually inspected, counted, and recorded separately. Egg, larval, and

adult stages of CLB can all be easily observed on grain stems or leaves. Larval instars were distinguished by head capsule widths. Late season field-edge grasses and nearby corn fields were also checked for summer/overwintering adults.

**Results** CLB was found in three new counties and rediscovered in one in 2002 including Crook, Tillamook, Linn, and Umatilla. This is the first re-detection in Umatilla since the original find in 1999, and the first detections in Central Oregon and on the coast. A total of 17 counties are now infested with CLB, including 11 western counties (Benton, Clackamas, Columbia, Lane, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill) and 6 eastern counties (Baker, Crook, Malheur, Umatilla, Union, and Wallowa) (Fig. 1).

Diagrams of temporal and peak abundance data for all life stages were made for winter and spring grains in three different climatic areas (Fig. 2). CLB has one generation per year. All life stages overlap to some degree, especially in the larval stages. Phenological data for winter grain fields was collected almost exclusively in 2002. Larvae from eggs laid early enough on winter grains can complete development before host quality declines.

In western Oregon, adults may be seen earlier than our recorded date. One adult was collected from a Lindgren funnel trap (from an unrelated survey) in Hillsboro on 3/15/01 of 2001. Adults emerge in early spring and begin feeding on winter wheat when daily temperatures are sufficient. Adults start ovipositing on winter wheat about the middle of April. It is likely that the cool spring temperatures protract development time. The first larvae are seen by the middle of May and are found through the end of June. Summer adults emerge by the first of July and may be actively feeding on nearby green grasses until August.

Adults move onto spring crops by mid to late April, as soon as the new shoots emerge from the soil, and begin to lay eggs immediately. Larvae are seen from early to mid May until early August. Summer adults start emerging by the end of June and feed briefly on the spring crops before moving onto corn or other late season green grasses such as Reed Canary grass.

Populations on winter wheat in Malheur Co. were present starting about 1 week later than the west side but quickly recovered, and summer adults finished feeding about 4 weeks earlier than those on the west side. Rapid development is likely due to a quick increase in spring daytime temperatures in this desert region. Adults appear on spring crops by the same time as those on the west side. Larvae may be present from early to mid May and as late as early August. Summer adults feed on the spring grains after emergence but disperse quickly due to a lack of suitable hosts in the surrounding environment.

The intermountain region including Union Co. has comparatively colder temperatures and shorter growing season. Development time is even more compressed than in Malheur Co. On winter wheat, adults first appear about a month later than those in Malheur Co. but complete

development only about a week later. Adults and eggs appeared at the same time suggesting that adults were present before this time. Larvae were present on spring grains from mid to late May until mid July, which is within the time period for larval presence in Malheur Co.

**Conclusion** In 2002, CLB spread into three new counties, increasing the total number of infested counties in the state to 17. Now six counties in the east and eleven in the west are infested with CLB. Three distinct climatic regions were identified in Oregon. CLB life stages were present the earliest and for the longest time period in western Oregon, but were latest and had the shortest activity period in the intermountain region. CLB phenology in Eastern Oregon is in between these two extremes. Our understanding of the timing of CLB life stages has expanded and can be used to increase the success of the biocontrol program.

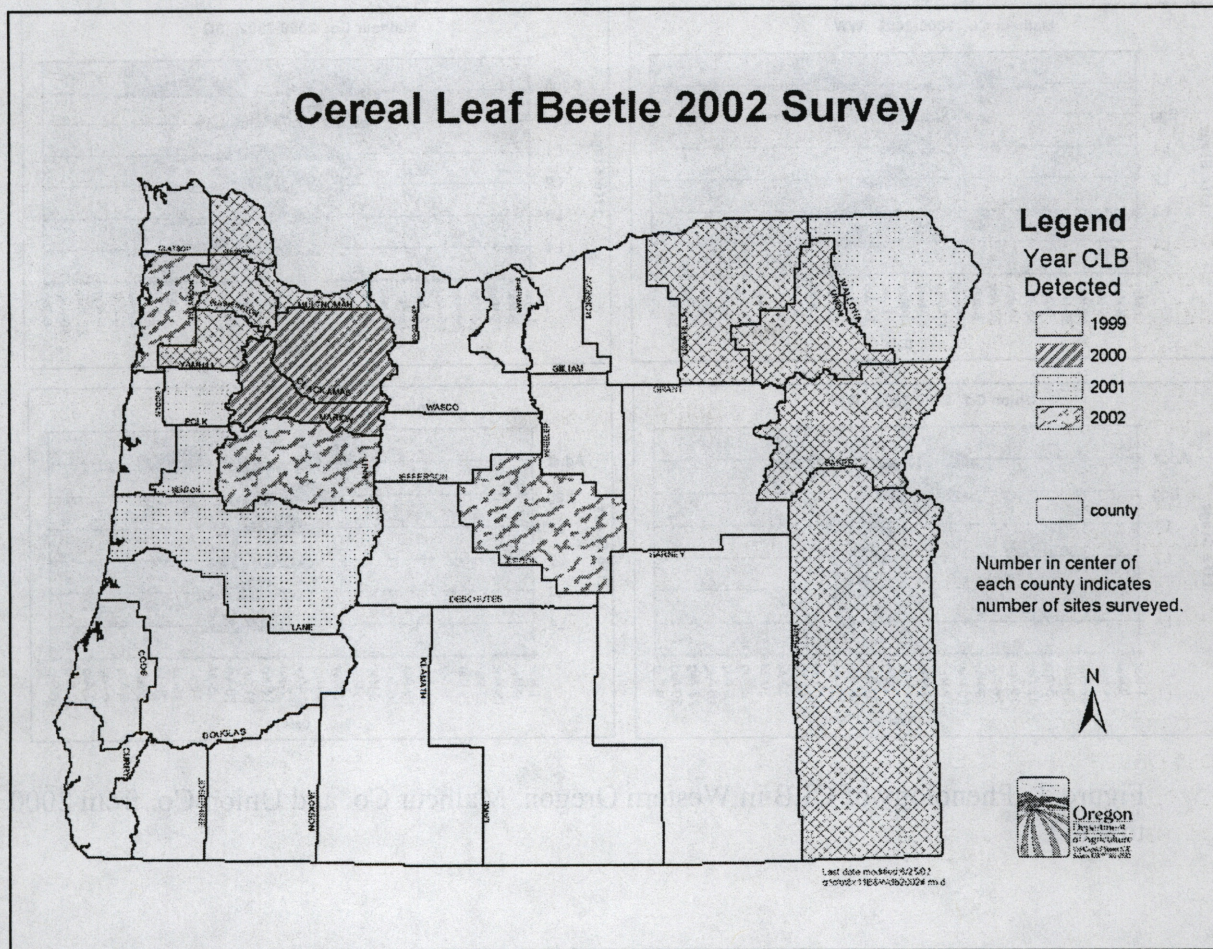


Figure 1. Oregon counties where CLB was detected from surveys during the last four years.

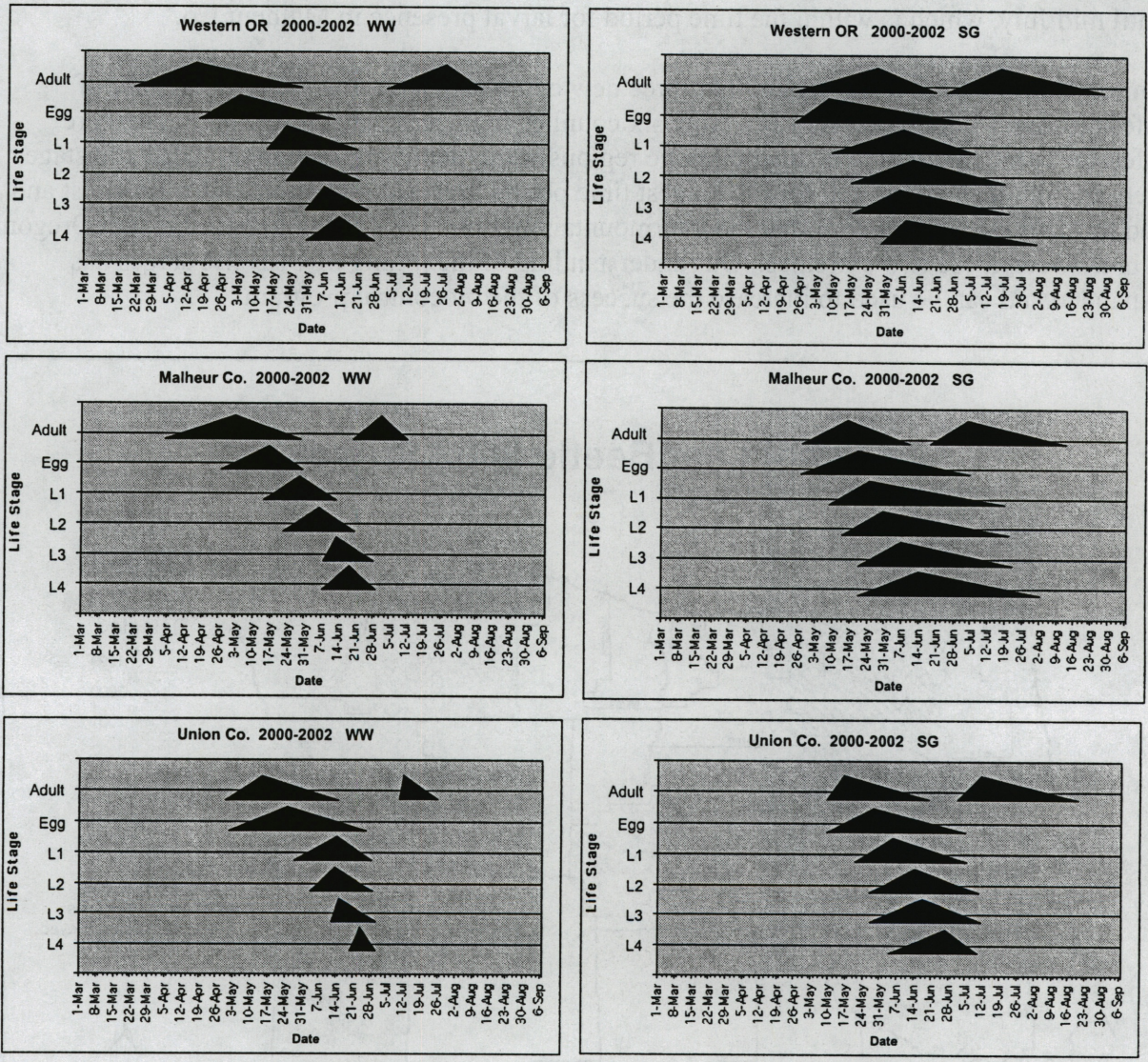


Figure 2. Phenology of CLB in Western Oregon, Malheur Co. and Union Co. from 2000 to 2002.