

Section III  
Biological & Cultural Control

PARASITOID RELEASE AND RECOVERY PROGRAM FOR CEREAL LEAF BEETLE IN  
OREGON, 2001

B.B. Bai<sup>1</sup>, R.A. Worth<sup>1</sup>, Kathleen J. R. Johnson<sup>1</sup>, and Gary Brown<sup>2</sup>

1. Oregon Department of Agriculture, 635 Capitol St. NE, Salem, OR 97301

2. USDA, APHIS-PPQ, 6135 NE 80th Ave. #A-5, Portland, OR 97218

[bbai@oda.state.or.us](mailto:bbai@oda.state.or.us) --- 503/986-4645

A biological control program for Cereal Leaf Beetle (CLB) in Oregon was initiated in 2000. This program was based on guidelines that have been used in the eastern states where CLB has been established since 1962. The program in Oregon continued in 2001, where bio-control releases were made in five counties. Here we report our results on: 1) parasitoid recovery for the year 2000 releases, 2) a pre-release survey of CLB for any existing natural enemies at potential new release sites, and 3) testing and release of imported biocontrol agents from other states.

Prior to releasing biocontrol agents from other states, we conducted recovery and pre-release surveys on CLB eggs and larvae from four Oregon counties (Multnomah, Washington, Union, and Malheur) to determine if release efforts in 2000 were successful and whether any native egg or larval parasitism exist. These counties were chosen as biocontrol release sites for either the egg parasitoid, *Anaphes flavipes* or the larval parasitoid, *Tetrastichus julis*, in 2000 and 2001. CLB eggs and larvae collected from fields were held in a growth chamber and refrigerator, respectively, in the laboratory until they could be dissected to determine parasitism. Eggs were collected from four sites each in two western and two eastern counties. None of the fields were release sites for *A. flavipes* in 2000 except the sites in Washington Co., which were about a mile or less from the biocontrol release sites. Larvae were collected from four Malheur, three Union, three Multnomah and two Washington county sites. Two fields in Malheur, one in Union and one in Multnomah were release sites for *T. julis* in 2000. No parasitoids were found in any of the samples collected. This suggests that no native egg or larval parasitoids of CLB existed in Oregon prior to biocontrol release activities. No biocontrol agents were recovered, even from release fields of 2000.

Two shipments totaling ca. 480 CLB eggs parasitized by *A. flavipes* were received from an insectary in Novelty, Missouri on 14 and 15 June. Five cardboard cups, each with ca. 50 CLB eggs were received for the first shipment, and four cups received for the second. These cups were put into growth chambers at 15~25 °C and a 15L:9D regime to await parasitoid emergence. Plastic petri dish tops were used as lids for these containers. On the inside surface of the lids, a 50% honey - 50% water mixture was applied to narrow strips of Kimwipe paper and stuck to the

lids to provide newly emerged parasitoid wasps with nourishment. After emergence, parasitoids were allowed to mate and feed for 24 to 48 hours and then were collected with an aspirator and taken to the field for release. 434 wasps emerged. More than one *A. flavipes* wasp can emerge from a single parasitized CLB egg. There was an average of 1.35 wasps per CLB egg for all containers. However, some wasps died inside the host egg before emergence. All nine containers had parasitism rates ranging from 90 to 100% with a mean of 95.3% (Table 1). There were also a few other species of parasitoids that emerged from the CLB eggs. These include a species of *Anagrus* (Mymaridae) and *Trichogramma maltbyi* (Trichogrammatidae), confirmed by Michael E. Schauff at the USDA - SEL, Smithsonian. The adult *A. flavipes*, were released in Washington county only (Fig. 1), near Banks.

Fourteen shipments of parasitized CLB larvae, from Utah, Montana, and Wyoming, were sent to Oregon for field releases. The shipments were sampled to determine the parasitism rates before field releases. Subsamples of approximately 50 CLB larvae from each container in each shipment were removed for dissections to determine rates of parasitism by *T. julis*. The Utah and some Montana samples were sent to ODA for processing and the rest went to Niles. We found a rate of 68.8% parasitism for Utah samples, but only 6.1% (ship'd 6/22/01) and 1.7% (ship'd 7/6/01) parasitism for material from Montana. The Niles Lab also found a low parasitism rate of 4.8% for the 7/6/01 material from Montana. Wyoming samples were sent to Niles Lab only and were found to be 38.5% parasitized. Some larval samples were also tested for the degree of parasitism. We recorded the number of *T. julis* larvae per CLB larva. (Fig. 2). We found that Utah material most frequently had five *T. julis* larvae per CLB while Montana material had a peak frequency of four.

In Western Oregon we released 10,000 CLB larvae, presumably parasitized by *T. julis*; 1000 from Utah and 9000 from Montana, on Sauvie Island, Multnomah Co. In Eastern Oregon we released 19,175 CLB larvae in three counties. Baker Co. was the new county targeted for release this year (Fig.1). Two thousand larvae from Montana were released in Baker Co., and 13,275 larvae, also from Montana, were released in Union Co. Malheur Co. received 1900 CLB larvae from Utah and 2000 from Wyoming. A total of 2900 larvae from Utah, 24,275 from Montana, and 2000 from Wyoming were shipped to Oregon for releases.

Our pre-release survey in 2001 indicated that no natural enemies, either native or exotic, of CLB were found in Oregon. The egg parasitoid, *Anaphes flavipes*, was imported from Missouri and released in one site in Western Oregon. The larval parasitoid, *Tetrastichus julis*, from Wyoming, Montana, and Utah was released in eight sites in Eastern Oregon and three sites in Western Oregon. Pre-release sampling of the imported CLB larvae showed that parasitism rates were low (< 50%) for most of the material except that from Utah.

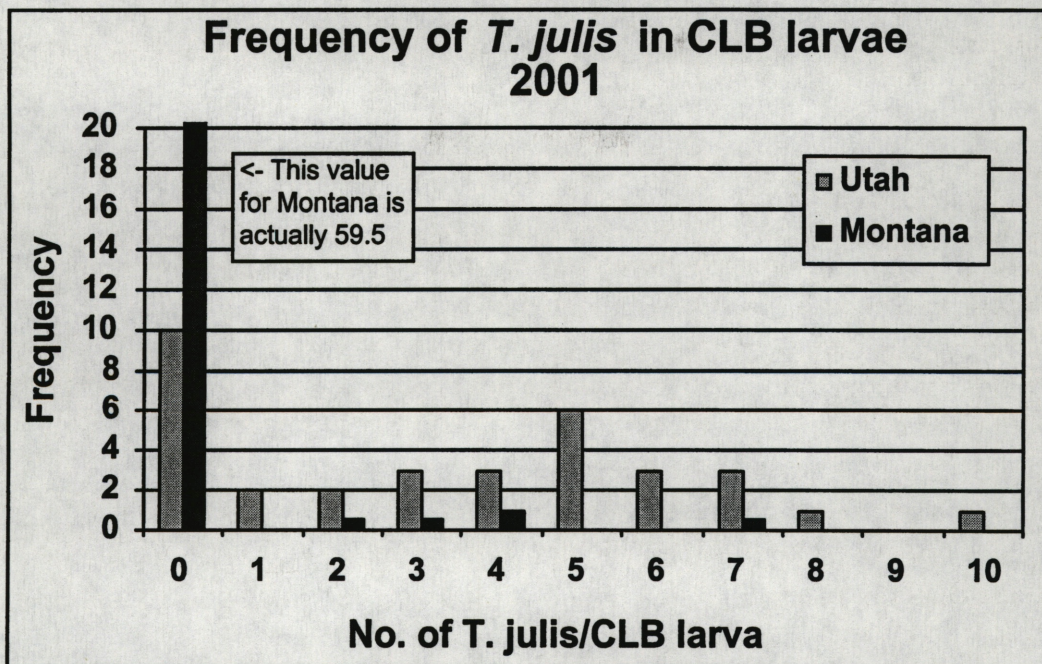
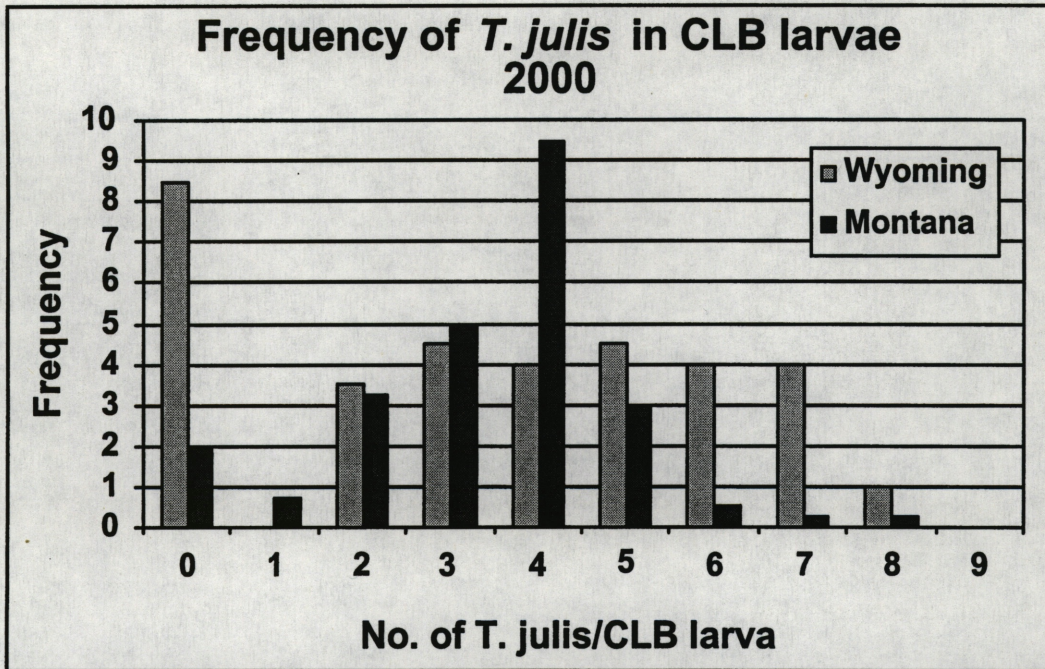


Figure 2. Frequency distribution of CLB larvae containing various number of *Tetrastichus julis* parasitoids, collected from Utah and Montana in 2001. Year 2000 data shown for comparison.