

## GSCSSA Progress Report - 2006

**Title:** Cereal Leaf Beetle in Oregon: Potential Impacts on Grass Seed and Sustainable Management (Year 2)

**Objectives:** The goal of this proposal is to study the impact of the cereal leaf beetle on grass seed production in Oregon and to develop a sustainable strategy for its management. Our specific objectives are:

1. To evaluate foliage-feeding damage by larvae and adults on grasses grown for seed under choice and no-choice situations.
2. To develop and evaluate field insectaries for sustainable management of CLB

**Principal Investigator:**

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**Cooperators:**

- Glenn Fisher, Professor, Extension Specialist-Entomology, Corvallis, OSU.
- Daryl Ehrensing, Hyslop Crop Science Research Laboratory, OSU: Assistance with development of field insectary at Hyslop organization of workshop for growers and field men
- Darrin Walenta, Union County Extension Service, LaGrande, OSU: Assistance with development of field insectary at Hyslop and organization of workshop for growers and field men
- Barry Bai, Oregon Department of Agriculture, Salem, OR: Assistance with evaluation of biological control of CLB
- Gary Brown, USDA-APHIS, Portland, OR: Assistance with development of field insectary

**Industry Cooperators:**

- Grass seed growers and field men in the Willamette Valley and eastern OR.

**Abstract:** The host range of CLB was evaluated for a second year. Wheat, perennial ryegrass, annual ryegrass, tall fescue, fine fescue, orchard grass, and Kentucky blue grass were planted in fall and in spring. Oats and triticale were planted in spring. Weekly observations indicated higher numbers of adults on fall planted wheat compared to the grasses in spring. Numbers of eggs and larvae were also higher on cereals than on grasses, except for orchard grass. Adults were higher on grasses when the cereals were drying. Based on our data, grasses are at risk of damage by CLB in late summer. To initiate biological control of CLB, an insectary was set up in Corvallis for build up of *Tetrastichus julis*, a larval parasitoid of CLB.

**Justification:** The cereal leaf beetle (CLB) is a pest in grains but is also known to attack grasses. A study is needed to determine whether the grasses that are raised for seed in Oregon are at risk of attack by CLB.

Application of insecticides is expensive and growers will benefit if a sustainable management strategy is developed. Biological control has proven to be successful in CLB control in the Midwest and the east. Adoption of similar strategy will benefit Oregon grass seed growers, enabling them to save costs associated with application of insecticides.

**Progress:**

Objective 1. To evaluate foliage-feeding damage by larvae and adults on grasses grown for seed under choice and no-choice situations.

This experiment was repeated from the previous year to determine year to year differences. In fall, grasses including perennial rye grass, annual rye grass, tall fescue, orchard grass, Kentucky blue grass and fine fescue, were plants along with winter wheat. In spring all grasses, wheat, oats and triticale were planted. Weekly observations were made on the number of adults, eggs and larvae.

Among the grasses orchardgrass had the highest number of eggs ad larvae but damage was not extensive (Table 1). Overall the impact was greater on cereals compared with the grasses. As in the previous year, CLB adults preferred cereals to spring planted grasses for egg laying in early spring. Hence spring planted grasses are not likely to be affected by CLB larva feeding. In late summer, when the cereals are drying, adults move from cereals to grasses and hence grasses are at risk to damage at this time of the year.

Table 1. Comparison of CLB adults and immatures on grasses compared to cereals

Host	Adults	Eggs	Larvae	Adults
Wheat (F)	0.086	1.09	0.18	0
Orchard grass (F)	0.014	0.84	0.31	0.033
Tall Fescue (F)	0.043	0.13	0.04	0
Perennial ryegrass (F)	0	0.04	0	0
Fine fescue (F)	0	0	0	0
Kentucky blue grass (F)	0	0	0	0
Oats (S)	0.014	0.281	0.281	1.422
Triticale (S)	0.014	0.344	0.169	1.578
Wheat (S)	0.029	0.25	0.131	1.256
Annual ryegrass (S)	0	0.006	0.006	1.044
Perennial ryegrass (S)	0	0	0	0
Tall fescue (S)	0	0	0	1.813
Orchardgrass (S)	0	0	0	1.138
Kentucky bluegrass(S)	0	0	0	0.175
Fine fescue (S)	0	0	0	0.038

Objective 2. To develop and evaluate field insectaries for sustainable management of CLB

A 3.3 acre insectary was set up at the Hyslop Field Laboratory for establishment of the CLB larval parasitoid, *Tetrastichus julis*. Cereals were staggered in planting to ensure the presence of adequate foliage for feeding by adults and larvae. In collaboration with USDA-APHIS and ODA, parasitized CLB larvae were added to the insectary. The plot was left undisturbed over the winter for maximizing parasitoid survival. The following spring, additional parasitoids were released into the previous year's grain, while spring oats were planted into the adjacent area. Dissection of CLB larvae by ODA in spring indicated that the parasitoid had successfully survived the winter at Hyslop. Our dissection of 2 sets of 20 larvae indicated 40 – 50 % parasitism. The number of parasitoids in each CLB larva ranged from 1 to 5. Parasitoid survival over the winter and the high numbers of parasitoids within CLB larvae are good indications that high parasitoid build up at Hyslop is possible.

**Interactions:** The research was conducted in collaboration with researchers at Oregon State University main campus and the Union County Extension Service, and with researchers at the Oregon Department of Agriculture and the USDA APHIS

**Publications:**

- Fisher, G., Rao, S., Mellbye, M. and Gingrich, G. and Bragg, D. 2004. Grass Seed Pests. *In* PNW Insect Management Handbook 2003, OSU, Corvallis, OR. pp: 216-222
- Rao, S., Hoffman, G., and Ehrensing, D. 2005. Update on Cereal Leaf Beetle Insectary at Hyslop. *Crop and Soil News/Notes*, Oregon State University Extension Service.19: 4

**Presentations:**

- Cereal Leaf Beetle activities, Hyslop Farm Field Day, Corvallis, OR. May 2005.
- Cereal Leaf beetle impacts on grass seed production. Grass Seed Cropping Systems for Sustainable Agriculture, Annual Meeting 2004, Moscow, ID.
- Current and emerging insect problems in seed production. Oregon Seed Growers League Annual Meeting. Portland, OR, December 2004.

**Timeline:**

The host range study has been completed. Parasitoid population build up in the insectary is encouraging. A second year evaluation of the parasitoid survival and dispersal to growers fields is in progress and will continue until next summer.