AGRICULTURAL RESEARCH FOUNDATION
FINAL REPORT
FUNDING CYCLE 2013 – 2015

TITLE: Determining distribution and monitoring for potential crop damage caused by the newly detected clover casebearer moth, *Coleophora deauratella*, in Oregon clover grown for seed

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SUMMARY: The clover casebearer moth, *Coleophora deauratella*, is a major pest of red clover seed production in western Canada, limiting production of that crop for more than one year. While red clover is known to be the preferred host plant, *C. deauratella* is also a major agricultural pest in New Zealand and Tasmanian white clover seed and pasture production. One study reports an average seed yield reduction of 63% in 7 white clover fields included in a New Zealand study. In 2012, the *C. deauratella* was detected in 3 commercial red clover seed fields in western Oregon. Samples from pheromone traps were sent to the University of Alberta and specimens were positively identified by entomologists who work with this species. There was no known presence of this insect in western North America prior to this detection. This study was aimed at determining the distribution and basic behavior of this potential pest in Oregon clover grown for seed crops.

OBJECTIVES:

1) Determine distribution and abundance of *C. deauratella* in red and white clover seed production in western and eastern Oregon.

2) Evaluate whether *C. deauratella* is causing economic yield loss by damaging seeds.

3) Extend results to the growers, industry representatives and others in the clover seed industry via grower meetings, research reports, and field events.

4) Utilize data collected to pursue future funding from other sources if insecticide or other pest management work is deemed necessary.

PROCEDURES: In 2013 and 2014 sex pheromone-baited traps were placed in eight commercial red clover seed fields and three commercial white clover, seed fields to attract male moths. Green Unitraps (Fig. 1) were baited with gray septa lures placed 35 cm above the soil surface and at least 5 m from the field edge and number of moths per trap were monitored weekly for 14 weeks beginning the first week of May. Fields were located in Benton, Linn, Marion, Washington and Yamhill counties and stands varied in age from 1 to 6 years. At peak bloom (BBCH growth stage 65) 100 mature inflorescences and 100 immature inflorescences were sampled and evaluated for floret damage caused by *C. deauratella.*

Figure 1. Green Unitraps used in the field monitoring project

SIGNIFICANT ACCOMPLISHMENTS: In 2013, a weekly average of 98 moths was recorded per trap in red clover fields and 207 moths were recorded weekly in 2014. In white clover fields, 5 to 6 moths were recorded in traps each week for both years (Fig. 2). In both years, moths were found each of the counties and the number of adults recorded was greatest in the months of June and July (Fig. 3). Higher numbers of adults were found in second and third year red clover fields compared to first year red clover fields or white clover fields of any age. Larval feeding damage was recorded in only 8 florets per 1000.

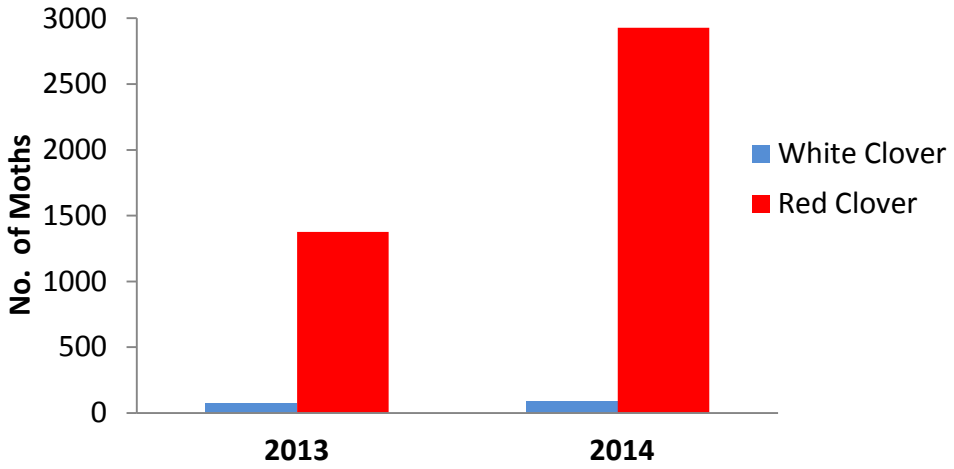

Figure 2. Total number of male moths recorded in red and white clover seed fields 2013-2014.

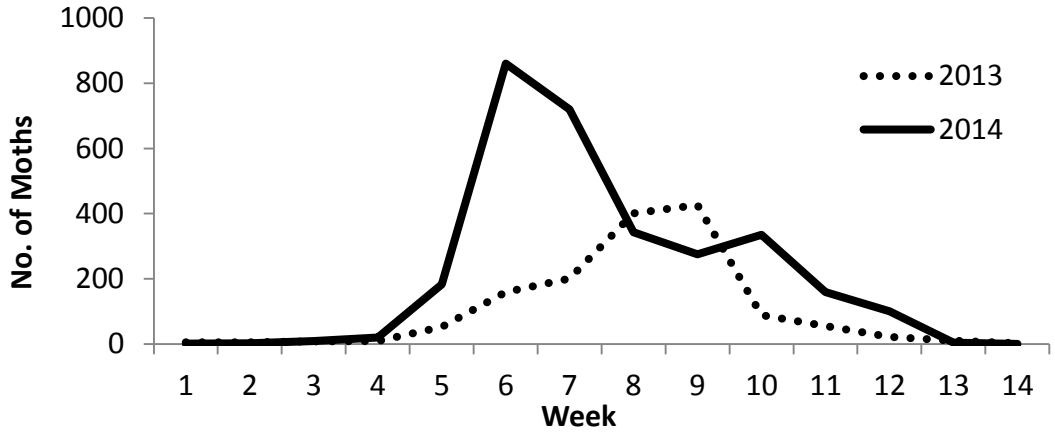

Figure 3. Number of adult male moths collected per week in 11 fields for 14 weeks, beginning May 1.

These results indicate that *C. deauratella* is present in commercial clover seed fields in at least 5 counties of Oregon's Willamette Valley. It appears that this pest favors red clover more than white clover and is most likely to be present in fields during June and July. Numbers of moths found in traps decreased when insecticide sprays were made but seemed to recover to some degree. Because very limited feeding damage was found in collected florets and there are no reports of unusual seed yield losses, it does not appear that economic crop damage is occurring in Oregon at this time.

Data collected in this study was discussed at several OSU field days and was also included in presentations at the Oregon Clover Seed Growers Annual Meeting in 2014 and 2015.

BENEFITS & IMPACT: This work has allowed the clover seed industry to become aware of a new potential pest threat. We have successfully identified red clover to be the crop species that is most likely to be impacted in the future. Far fewer numbers of moths were found in crimson and white clover fields over the two year study period. We have developed important knowledge on moth flight timing in commercial fields. We also now have a general idea that the most common insecticides currently used on clover grown for seed crops in Oregon at least partially reduce the number of moths found in Willamette Valley fields. Trends in seed yields should be monitored and periodic evaluation of larval feeding damage in seed heads should continue into the future.

ADDITIONAL FUNDING RECEIVED: A total of $5,177.50 was received from the Oregon Clover Commission to further support monitoring work in 2013 and 2014.

FUTURE FUNDING: The Oregon Clover Commission has approved $3,000 of funding for additional monitoring work to be completed in 2015.