

## **Title: Monitoring Insect Populations in Uintah and Duchesne Counties**

**Project Leaders: Boyd Kitchen and Troy Cooper**

### **Situation Statement**

Populations of several species of insects can cause significant damage to crops and rangelands in the Uintah Basin. Mormon crickets, grasshoppers, army cutworms and alfalfa weevil have caused significant economic damage in Uintah and Duchesne Counties in recent years. However, these insects do not reach economic thresholds every year. Detection of insects and determination of population densities during the early stages of an infestation is critical to effective control measures while minimizing unneeded insecticide applications.

Scouting for potentially damaging insects during the spring has been successful in reducing the damage caused by the insects listed above. However, because resources are limited and agents' efforts are spread thin, agents do not have sufficient time to locate and evaluate insect populations. In 2002, grasshopper populations were high in some areas of both counties, but by the time the problem was identified by producers the grasshoppers were past the stage to be effectively controlled.

### **Objectives**

This effort targeted 4 species of insects: Mormon crickets, grasshoppers, army cutworms and alfalfa weevils. A fall armyworm infestation occurred in a limited location and was addressed in this effort.

1. Educate producers and farm service people on the biology of the target insects and enlist their support in scouting and tracking populations.
2. Use grant funds to hire and train a person to scout for insects early to identify and evaluate insect populations in Duchesne, Daggett and Uintah Counties.
3. Validate thresholds.
4. Share results of the program with Extension throughout Utah.

### **Outputs**

We held one meeting on March 27, 2003 to teach producers and farm service people the biology of the insects and when and how to scout. Twenty-two individuals attended the meeting. The emphasis was on stages of growth, where to look for immature insects, economic thresholds, and control measures. The meeting was held at the Roosevelt campus of USU. Troy Cooper covered alfalfa weevil and grasshoppers. Boyd Kitchen covered army cutworms and Mormon crickets. Computer slide shows were developed or adapted from those developed by other agents for each of the target species. Eight certified pesticide applicators signed up for 2 CEU's in pesticide use management.

Offering CEU's helped to draw individuals to the meeting. Attendees were asked to report insect populations in the field.

Both agents spent considerable time scouting for insects. In addition, Jeanne Cushing, the Horticultural Assistant in Uintah County, was trained in scouting for the target species and in determining stages of growth and population densities. She traveled throughout Uintah and Duchesne Counties scouting for insects and following up on reports from producers and farm service people. Her services were especially valuable from late March into early June which is a very busy time for the agents. Grant monies were used to pay her wages and benefits for the hours she was involved in this project. Jeanne was trained in the use of a GPS receiver which was valuable in accurately identifying and communicating locations of insect infestations. Grant monies were used to purchase a Garmin V GPS receiver. Scouting efforts were focused in the areas where these insects had caused economic damage in recent years and where insect infestations were being reported by the public. Figure 1 is a map of insect infestations reported or found during scouting. The following table reports the number of telephone calls received and visits about these insects.

#### Insect Phone Calls Received Field Visits Made

Army cutworm (larva)	52	20
Miller moths	33	3
Grasshopper	27	18
Alfalfa weevil	12	9
Mormon cricket	3	3
Fall armyworm	3	2
Ips beetle	6	3
Total	136	58

We used local newspapers to get broader coverage on insect infestations. \_\_\_\_\_ articles were published in the Uintah Basin Standard and two in the Vernal Express. The Salt Lake Tribune published an article on the army cutworm infestation, but the local papers were more effective at informing producers. Copies are included with this report.

We also contacted producers and commercial applicators in the fall. We asked what control was attempted and what results were achieved with chemical control. Mormon crickets cutworm, grasshopper, alfalfa weevil and fall armyworm populations were generally high, so only general conclusions could be made regarding whether economic thresholds were adequate.

We will share what we did and the results with other agents in Utah at Regional meetings, USU Extension Annual Planning and Development Conference and at Ag agent meetings during the next year.

#### **Expenditures of Grant Funds**

In the grant proposal, we stated that we would pay travel, lodging and meals expenses to a student to come to the Uintah Basin from Logan to help with the scouting. By utilizing the part-time horticultural assistant already here, we saved considerable money. Thus the intent and need was fulfilled at a considerable cost savings.

#### Item Expenditures

Jeanne Cushing's wages and benefits @ \$8.96/hour X 40.5 hours 362.88

Garmin GPS V Delux 408.12

Total Expenditures 771.00

Unused Grant funds 522.00

Total Grant 1293.00

#### Outcomes

Army cutworm. Insect populations in Duchesne County reached densities exceeding 12 per square foot. Heaviest infestations were in crops adjoining rangelands. Where crops were sprayed, 80 to 90 percent control was achieved with cyhalothrin, permethrin or chlorpyrifos. Different commercial applicators preferred different chemicals. One said he thought that chlorpyrifos provided longer lasting control and helped control weevil better while another thought cyhalothrin provided the best cutworm and residual weevil control. In general, producers were satisfied by following thresholds and chemical recommendations. Much interest developed in the adult moths as they emerged and started migrating. Information was shared with the general public to help them understand that although the moths were a nuisance that no control was warranted.

Grasshoppers. High numbers occurred in Mt. Home, Neola, Lapoint, Deep Creek, Manila and the Book Cliffs. Densities exceeded 20 per square yard and were estimated to be 100 per square yard in some fields. In three of these areas, significant acres were aerially sprayed with malathion. In Manila, Neola and Mt. Home, there were 6000, 2000, and 1500 acres sprayed, respectively. The best control was achieved in Mt. Home at about 80% control. The Neola area achieved 70% control.

The results in Manila were generally viewed as a failure with several factors contributing. Timing was one issue. Nymphs were reaching advanced instar stages and some were beginning to fly by the time the producers organized to do the control. There was also some dissatisfaction with the applicator who may have not applied the chemical at a high enough rate and under conditions that prevented the chemical from reaching the ground. One producer in Manila used carbaryl bait and achieved 75% control at the 4th instar stage.

In other areas, some producers sprayed smaller areas with carbaryl. Generally treating smaller areas was ineffective because even if the treatment was effective in controlling the grasshoppers in the field, others moved in from nearby fields. Many producers decided to try to control grasshoppers too late after they had begun to fly and were

advised not to spray. One area in Lapoint of 800 acres saved \$2,400 because they decided not to spray after the window of opportunity had passed.

Alfalfa Weevil. Producers deal with weevil most years and so seemed to have a good handle on control. Commercial applicators said they had sprayed more than they have in recent years and that control was effective using pyrethroids or chlorpyrifos. Some producers used carbaryl but were not as satisfied with its results. In heavily infested fields, a second application was often made following the first cutting of hay because fields failed to regrow.

Mormon Crickets. Significant populations were located on rangelands on Blue Mountain and Diamond Mountain. However, they didn't migrate off those sites to croplands in 2003. Two ranchers were given information about how to obtain carbaryl bait from UDAF. The heaviest infestations remained east of the Utah border in Colorado.

During the year we were contacted by Greg Sword of USDA-ARS in Sydney, Montana who did some tracking of individual cricket movement using radio transmitters glued to cricket backs in Uintah County. His research may result in a better understanding of what causes cricket bands to move in particular directions and may help predict those movements in the future.

Fall Armyworm. In late August, Troy received a call from a producer whose corn fields were being damaged by a caterpillar. Samples were collected and identified as the fall armyworm. Even before the identification was completed, it was recommended to treat with a pyrethroid insecticide. Better than 90% control was achieved using cyhalothrin.

Ips Beetle. Troy received calls about the die-off of pinyon pine in western Duchesne County. Ips beetles were found. The individuals planned to remove the dead trees, debark the wood and spray the remaining live trees with carbaryl.