

2005 CEREAL LEAF BEETLE SURVEY OF UTAH

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Final report of a statewide survey, covering all 29 counties of Utah with the distribution and population levels recorded during the summer of 2005 of the cereal leaf beetle pest, *Oulema melanopus* (Linnè) in Utah. The objective of the CLB state survey was to determine if the any life stages of the cereal leaf beetle pest were present and the extent of infestation of cereal leaf beetles in the grain growing counties of the state. Data in the report will help to satisfy the requirements of the California Cereal Leaf Beetle Quarantine.

The overall objective of the CLB survey was to examine a minimum number (usually 5 or 6) of grain fields in each of the 29 counties of the state including whenever possible fields of wheat, oats and barley and recognize those counties which have detectable live forms of CLB or established populations in agricultural grain fields. In some cases triticale, rye and miscellaneous grasses were surveyed. An hp iPAQ 5500 Pocket PC with ISIS data collecting software was installed and used to identify and record data in the field for most of the survey sites. In addition all fields were identified with longitude and latitude using a Garmin eMap GPS unit at the stopping place on the edge of each location and a Field Work Data Sheet (FWDS) filled out to obtain a second hard copy of the data. Data recorded included all or in part: state, county, nearest town, location, crop, acreage, farmer, date, time, weather conditions, temperature, wind, crop condition, insect life stages present and numbers, survey method, pesticide use and surveyors name. Space was also provided for a small map to aid in identifying the survey site. An estimate of the acreage of the particular crop was recorded for most sites. Grassy fence rows, ditch banks and debris adjacent to grain fields or fields that were planted to grain during the previous growing season were sometimes surveyed in a similar manner since these sites are used as hibernation and feeding sites for the beetles during certain periods of the year.

The cereal leaf beetle is most successful in flood or sprinkler irrigated fields but in areas where these are not available dry land grain fields were included to make the survey complete for the county. In the past a number of infested dry land grain fields have been detected with cereal leaf beetle infestations but the beetles never seem to become established and the populations usually die out in subsequent years. Comparable populations and infestation levels of insects per square foot or per 100 sweeps were recorded by using USDA standards developed in the eastern United States. This data for each site is recorded and reported on a standard Field Work Data Sheet (FWDS). The survey of a field starts by using a standard 15 inch insect sweep net. This method detects very low population levels in most fields where other methods are not successful. In highly infested fields the number of eggs, larvae, and adults are counted and recorded for 1 square foot of planted crop. Positive and negative survey data were recorded on FWDS. Specimens, usually adults or possible feeding damage, may be observed during the movement from the different sites in the field and noted as valid data. If no specimens are collected or observed and only suspected feeding damage is observed during the previously described procedures, the field is considered free of cereal leaf beetles for the current year in this report.

Information from all field surveys and the data collected in the statewide survey is used to determine distributions and density of population of CLB for the entire state. Fields are first sampled by using a standard 15" sweep net and sweeping at least a total of 100 sweeps in at least five locations in the same field. Visual observations of any feeding damage are made and any flying specimens observed during the movement to each site are recorded. Positive observations are followed by additional sampling. This sampling procedure includes visual examination of 1 square foot of crop randomly picked from five widely separated places in the field. At each site a standard 20.5 inch stick is used to measure a short section of planted row of the crop. Plants in a row along this measured stick have been determined to be equivalent to 1 square foot of planted grain. Feeding damage or any life stage of the CLB on the growing plants are noted and recorded on the Standard FWDS. Field locations, crop type, crop age and condition, environmental factors and weather conditions are also recorded. If nothing or only suspected feeding damage is found, the field is considered free of cereal leaf beetle pest for the current year.

The first cereal leaf beetle specimens were collected in Cache County in March 2005. The earliest date CLB have been observed in Utah is the last week of February in 1999. Hibernating specimens can be found throughout the year if observations are made in the proper places such as under bark and similar hiding places. Early emergence of the beetle from hibernation sites coincides with the warm days in the spring. These early females feed for several weeks to store up energy in preparation for egg production. Ordinarily cereal leaf beetle egg laying activity does not start until late April. The first recorded field surveys were made in April in Logan, Cache County when eggs and adults were observed. An abundance of eggs and adults were observed during the next few weeks in May. Official survey activities for the project did not start until 5 May 2005 as we started to test the new ISIS program. As the new program was put into service, data was recorded on the 18th and 19th of May when substantial egg laying and some larvae were observed on emerging grain plants during frequent trips to the fields in Cache, Box Elder and Weber Counties. Some of the early egg laying and first instar larvae were damaged by cool, wet weather and frequent rain storms. The peak of egg hatching and larval feeding activity in northern Utah occurred during the period from the middle of May to the middle of June depending upon the stage of grain grown and the locality. Young and succulent grain is preferred just as oats and barley are preferred over wheat if the pest has a choice between nearby fields. The early egg laying and first instar larvae damaged by the cool, wet weather and frequent rain storms reduced the populations during this period of normal high frequency population levels. This may account for the low incidence of CLB in fields of some counties where beetles were more abundant in previous years. Sprinkle irrigation can also reduce population levels of eggs and young larvae as effective as a spray application during this time.

Feeding damage to the grain leaves can be detected even in dry, older browning leaves at the base of the grain plants. Survey activity throughout the months of May, June and July concentrated on completing the state-wide CLB survey in all 29 counties. It is believed that because of severe drought conditions in the state during the past few years the CLB populations have decreased in many counties. Survey data has confirmed this fact. In some cases the survey detected no CLB specimens or any feeding activity in fields that had fair or minimal populations in previous years even less than last year. In many cases a much more rigorous and extensive survey was conducted including additional fields, closer observation for feeding activity and additional sweep net sampling. The results are summarized at the end of the report but briefly the CLB pest is decreasing all over the state in the number of counties infested and the level of infestation in many counties.

All 29 Utah counties were surveyed which included a total of 152 observations and some additional unrecorded sites. A few sites were surveyed twice or three times on different dates to substantiate the

presence or absence of CLB but only the first survey is included in this report. The following is a summary of the results with some interesting notes.

Cache (5 sites), Box Elder (5 sites), Weber (5 sites) and Davis (6 sites), report all sites with well established populations of CLB. Many more sites were surveyed in these counties and monitored for the biological control project. Most sites have also established larval parasite populations that control the economic damage of the pest.

The following counties have established populations of CLB but the beetles are either decreasing in severity at the individual sites or in the number of sites in the county:

Davis with 5 sites surveyed, established populations at 5 of the 6 sites.

Utah County with 6 sites surveyed, five sites with well established populations and one site with no detectible populations.

Tooele with 6 sites surveyed only two of which had a very low CLB population. No CLB at the other sites.

Sevier with 6 sites surveyed and established populations of CLB at 2 of these sites.

San Pete with 5 sites surveyed and established populations of CLB at 5 sites.

Rich with 5 sites surveyed for CLB and very low populations of CLB at 4 sites.

Morgan with 5 sites surveyed for CLB beetle had established populations of CLB at 1 site. This is the county of the original discovery of CLB in 1984 when over 1000 acres was infested.

Juab with 5 sites were surveyed for CLB with established populations at one site.

The following counties had no signs or evidence of CLB life stages during the indicated number of survey sites:

Beaver; 5 sites surveyed.

Daggett; 5 sites surveyed.

Emery; 4 sites surveyed.

Garfield; 6 sites surveyed.

Grand; 6 sites surveyed.

Iron; 6 sites surveyed.

Kane; 5 sites surveyed.

Millard; 6 sites surveyed.

San Juan; 5 sites surveyed.

Washington; 6 sites surveyed.

Wayne; 6 sites surveyed.

Piute; 6 sites surveyed. The site with one positive larva in the field two years ago had young grain but no signs or evidence of feeding damage this year or last year

The following counties have had CLB life stages found in the county during previous years but no signs or evidence of the beetle this year:

Salt Lake; 5 sites surveyed but no CLB present even at the site that two years ago had larval or adult life stages of CLB present.

Duchesne; 6 sites surveyed for CLB had no signs or evidence of any life stages even at the same sites where larva and adults were collected in previous years.

Carbon; 4 sites surveyed for CLB had no signs or evidence of CLB or any signs of feeding damage. Some life stages of CLB have been found in a few fields in past years.

Piute; 6 sites surveyed. The site with one positive larva in the field two years ago had young grain but no signs or evidence of feeding damage this year or last year
Wasatch; 5 sites surveyed for CLB had no signs or evidence of CLB this year.
Uintah; 6 sites surveyed. Fields with larvae in the field last year had no signs or evidence of feeding damage this year.

All data available on collecting sites (longitude and latitude), specimens found, life stages, population density, grower's name, survey date, crop, and acreage were tabulated and placed in a Microsoft Excel computer file.

Summary: No evidence of cereal leaf beetle presence was found in the twelve southernmost counties of the state and five northeastern counties, which included 152 surveyed fields. This increase in the number of counties with no CLB populations (17 counties) is probably a result of the prolonged drought that Utah has experienced. It is expected that new populations and infestations will be found in the coming years because of increased rainfall and the introduction of more efficient irrigation systems by underground pipes, wheel lines and pivots. There was a total of approximately 285,000 acres of grain planted (estimated from 2003 figures) in Utah during the 2005 growing season. The survey therefore averaged about one field for each 1,875 acres planted. The target acreage was much greater than this figure since irrigated fields were targeted over dry land acreage in most counties.