DATCP'S 2004 INSECT SURVEY RESULTS AND OUTLOOK FOR 2005

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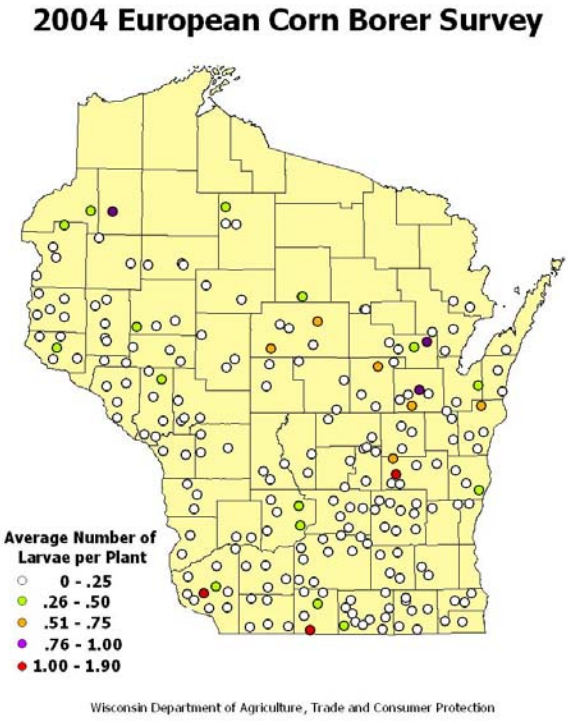
A few key variables merged to make 2004 an exceptionally quiet year for many of Wisconsin's leading field crop pests. Chilly spring temperatures and an unprecedented statewide average rainfall of 7.64 inches in May made it difficult for potential insect populations to fully develop. Migratory species, like the black cutworm and potato leafhopper, arrived to find the wettest spring in more than 100 years. Below-normal temperatures continued to slow crop development while the surplus of precipitation left fields saturated through June. Together these factors drastically reduced insect populations. As a result, European corn borers were practically nonexistent this fall and soybean aphid densities were at their lowest levels since being detected in Wisconsin in 2000. Following are the results of DATCP's insect surveys from 2004, a summary of last summer's pest insect trends, and an outlook for pest conditions in 2005.

EUROPEAN CORN BORER

2004 Survey Results

Wisconsin's 2004 fall European corn borer survey documented the lowest overwintering population of corn borers since 1998, and the third lowest in 50 years. Survey results continue to show a pattern of very low overwintering densities of this insect pest. In 2004, the statewide average percentage of plants infested by corn borers was 12%, while the statewide average number of corn borers was 0.10 per plant. The 2004 statewide average is substantially lower than both the 10-year average of 0.49 borer per plant and the 50-year average of 0.48 borer per plant. Population declines were found in all but the north central district, where only a very minor increase from 0.14 borer per plant in 2003 to 0.20 in 2004 was recorded. The biggest declines occurred in the south central (0.52 to 0.05 borer/plant), southwest (0.35 to 0.10 borer/plant) and central districts (0.44 to 0.06 borer/plant). The 2004 fall survey included 222 grain corn fields throughout the state.



Why was the 2004 fall population of corn borers so low? First, the overwintered population of larvae from 2003-2004 was very low. The 2003 survey documented a statewide average of 0.30 borer per plant, suggesting that the first flight of moths in 2004 would be light. Next, when moths of the first flight began to appear in black light traps around June 4, intense and persistent periods of rainfall combined with overall cool temperatures suppressed flight activity and increased mortality rates of tiny, newly-emerged larvae. In addition, when moths of the second flight were active in late July and August, evening temperatures were unseasonably cool; little corn borer activity occurs when temperatures dip below 60ºF. Below-normal temperatures severely limited mating and egg laying activity of the first and second flights of corn borer moths.

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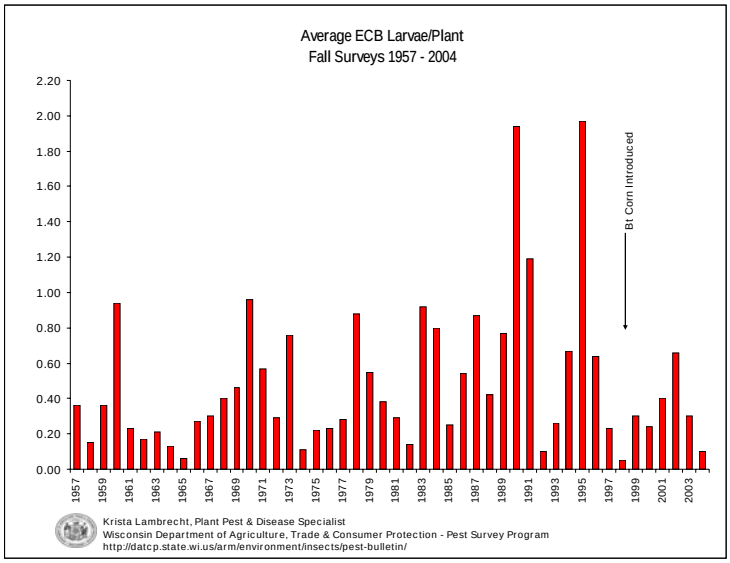
In summary, harsh weather conditions impacted corn borers during critical stages of development, and were the principal cause of the decline in corn borer abundance in 2004. The 2004 statewide average of 0.10 corn borer per plant represents a very low fall population, as well as a very low infestation of corn borers that Wisconsin producers had to manage last season.

District	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	10 Yr Ave
NW	0.10	0.32	0.03	0.02	0.15	0.24	0.33	0.44	0.20	0.13	0.20
NC	0.17	0.41	0.26	0.01	0.03	0.04	0.05	0.26	0.14	0.20	0.16
NE	0.53	0.47	0.18	0.01	0.18	0.03	0.07	0.75	0.23	0.22	0.27
WC	1.21	0.80	0.15	0.02	0.30	0.31	0.67	0.71	0.16	0.05	0.44
C	1.23	1.02	0.09	0.02	0.30	0.41	0.48	1.21	0.44	0.06	0.53
EC	2.49	0.65	0.26	0.03	0.25	0.19	0.33	0.44	0.22	0.22	0.51
SW	6.31	0.51	0.39	0.17	0.57	0.39	0.87	0.65	0.35	0.10	1.03
SC	2.65	0.83	0.35	0.10	0.61	0.33	0.48	0.86	0.52	0.05	0.68
SE	3.08	0.79	0.35	0.10	0.31	0.16	0.36	0.61	0.17	0.02	0.60
State Ave	**1.97**	**0.64**	**0.23**	**0.05**	**0.30**	**0.24**	**0.40**	**0.66**	**0.30**	**0.10**	**0.49**

Figure 2. European corn borer fall survey summary 1995-2004 (by district).
Average number of borers per plant.

Outlook for 2005



Fall survey results suggest growers can expect a very light first flight of moths in May and June of 2005. With a fall population as low as 0.10 borer per plant it is unlikely that corn borer densities will recover enough to cause significant problems for growers in 2005, though favorable weather during the 2005 growing season could result in a considerable increase of borers near the hotspots where counts exceeded 0.75 borer/plant (see map on page 1). As always, growers are encouraged to pay particularly close attention to the first flight of moths and growing degree day accumulations, and to scout for injury caused by first generation larvae next spring. Black light trap counts are available at: **http://datcp.state.wi.us/arm/environment/insects/pest-bulletin/**

CORN ROOTWORM

This year's corn rootworm larvae were apparently not hindered by June's dismal weather and flooded fields, as corn rootworm beetles appeared right on schedule by July 8. July brought warmer weather and many replanted fields that provided fresh silks and an ideal setting for egg laying for an extended period of time. The first western corn rootworms of the season were detected in Green Co., and by the following week, northern corn rootworm beetles were observed in Dane Co. While beetle populations grew in the south, larval hatch continued northward as light lodging and larval activity were observed in Trempealeau Co. during the week of July 16.

Scouting efforts in the southeast around July 30 revealed beetle populations were generally less than the threshold of 0.75 beetle per plant. During the first week of August, light amounts of silk feeding and an average of fewer than 0.82 beetles per plant were noted in southern fields. And despite a chilly August, which further hindered corn development, beetles fared well in fall, with populations ranging from 0.3-2.1 beetles per plant in the central sands region.

In contrast, September was unusually warm, and corn rootworms had four more weeks of nearly perfect conditions for mating and egg laying. Although no official count was made, it appeared that numerous fields across the state had populations that far exceeded the threshold of 0.75 beetle per plant or 38 per 50 plants. In the south central district observations of 4-7 beetles per plant were not uncommon. Beetles persisted into October as far north as Polk Co., indicating they had plenty of time to lay an abundance of eggs. If winter weather conditions are not cold enough to kill at least a fraction of overwintering rootworm eggs, growers replanting to corn can expect heavy larval populations and instances of severe lodging next spring.

WESTERN BEAN CUTWORM

The western bean cutworm is a late-season pest of field corn and dry beans that was seldom found in Wisconsin prior to the late 1990s. Western bean cutworm typically had a very limited range in the western cornbelt states, including in Nebraska, Wyoming, Kansas and Colorado, but on occasion significant outbreaks were known to occur in surrounding states. In recent years, the areas of significant activity have expanded eastward. In Wisconsin, the western bean cutworm has been making a regular appearance in western and southern black light traps for several years now (as far east as Mazomanie in Dane Co. last summer). The increasing frequency of sightings suggests it's time for growers to be on the lookout for this pest, particularly if we have another mild winter that favors survival of the larvae. Western bean cutworm feeds mostly on corn ears, damaging kernels and leaving the ear susceptible to secondary fungal infections and molds. This pest has the potential to cause large yield losses in corn and is often present in successive years.

Researchers believe there are a few key reasons why the range of western bean cutworm has been expanding. First, climatic factors have been particularly influential. Milder winters have made overwintering possible in areas where western bean cutworm was unable to survive in the past. Further, western bean cutworm prefer sandier soils for overwintering, and increased winter survival has meant increased potential to expand to areas with preferred soil types. Next, it appears that Roundup Ready® soybeans may be having an indirect impact. In fields planted with Roundup Ready® crops, soils are generally disturbed less; this translates into less disturbance of overwintering prepupae. Last, Bt transgenics may also be a factor in the recent expansion of western bean cutworm. Because of Bt transgenics fewer pesticides are being used, and the elimination of other species of larvae may be lowering the overall incidence of insects and reducing direct competition within the ear. (*Information from Gary Hein [NE Extension Entomologist Panhandle REC]*)

Another interesting feature of the western bean cutworm is that while corn appears to be its primary host, its host preference changes from corn to dry beans around mid-summer; corn is most attractive for egg laying. In the west central plains states there is one generation per year.

Adults begin to emerge late June/early July and damage becomes visible mid-August to early September. Scouting for western bean cutworm should begin as soon as the first moth is noticed.

The best method for monitoring western bean cutworm is with the use of black light traps. Peak trap catches directly indicate when the peak flight/ peak egg laying period is in progress; flight typically peaks just prior to corn tasseling. Treatments to control western bean cutworm are most effective from tassel formation through late August. Consider applying an insecticide if eight percent of the plants have an egg mass or young larvae in the tassel. Look for updates on the Western bean cutworm situation in summer issues of the Wisconsin Pest Bulletin at: h**ttp://datcp.state.wi.us/arm/environment/insects/pest-bulletin/**

Western Bean Cutworm Growing Degree Day Model (base 50°F)

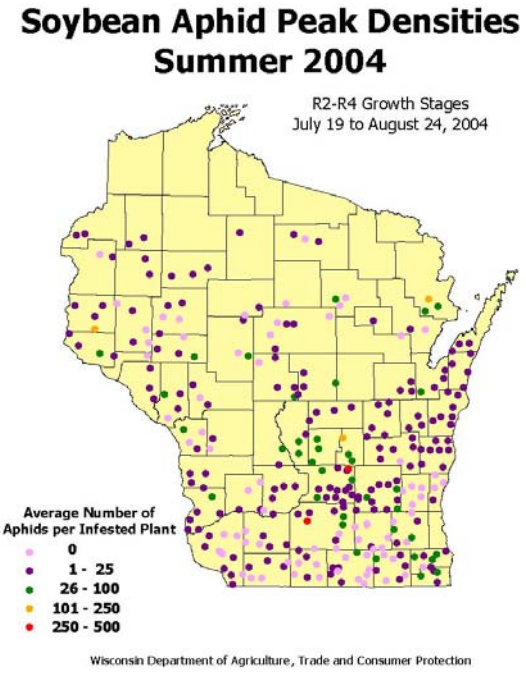
25% emergence	1319 GDD
50% emergence	1422 GDD
75% emergence	1536 GDD

SOYBEAN APHID

With each passing season, the soybean aphid continues to surprise and elude entomologists, DATCP's pest survey staff and farmers alike. Following record levels of aphids in 2003, densities dropped to the lowest levels since soybean aphids were first detected in Wisconsin just five summers ago. While it appears that soybean aphid populations have been very cyclic in Wisconsin and throughout the Midwest in general, forecasting the extreme fluctuations in the aphid populations from year to year has proven difficult. Aphid experts had predicted the possibility of lower aphid densities in 2004, but no one expected just how much lower they might be. For the first time since 2000, soybean aphids did not colonize an estimated 27% of the state's soybean fields; in previous years staff were pressed to find any fields without aphids.

2004 Survey Results

The 2004 summer soybean aphid survey took place between July 19 and August 24 and included 293 sites. Aphid densities were assessed during the R2-R4 stages of growth, when populations were forecast to peak. The 2004 survey found that soybean aphid population densities declined dramatically in all districts compared to 2003. The highest density of 53 aphids per infested plant, detected in the central district, compared to an average of 680 aphids per infested plant in that same district in 2003. The statewide average number of aphids per infested plant declined from 770 in 2003 to 15 in 2004. Further, soybean aphids were not detected in 27% (80/293) of the soybean fields surveyed last season. In 2003, soybean aphids were not detected in only 1 of the 289 fields included in the survey.



Outlook for 2005

If soybean aphid populations are indeed cyclic, then 2005 may turn out to be the next big year for the soybean aphid. Much to our dismay, there's evidence to support this theory. University of

Illinois-Extension entomologists monitored the fall migration of soybean aphids from soybeans to buckthorn (the primary host) to estimate the potential for soybean aphids in 2005; fall populations of flying soybean aphids may be indicative of relative densities from one year to the next. Soybean aphid migration was tracked via nine suction traps that were in place throughout the state of Illinois. Based upon a limited amount of suction trap data from this fall and from previous years, David Voegtlin, entomologist at the Illinois Natural History Survey, warns that the potential exists for significant infestations of soybean aphids to develop in 2005. Fall suction trap catches of soybean aphids were high enough to suggest that populations may build to economically important levels in 2005.

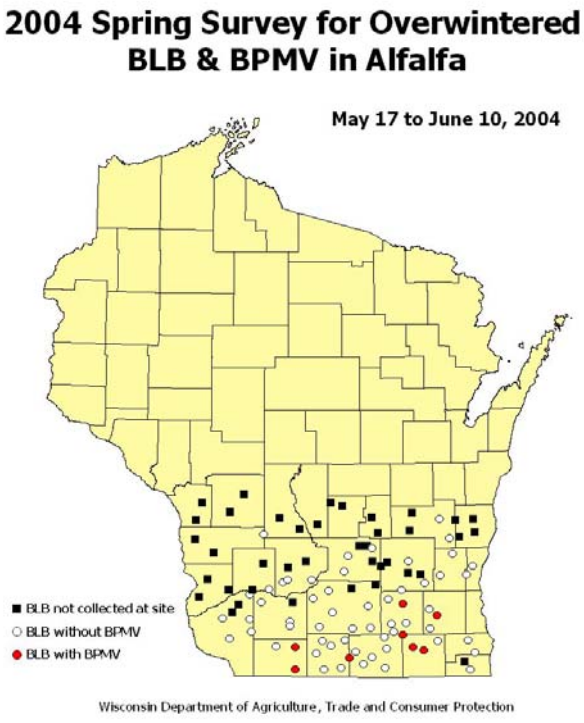
While 2004 was a light soybean aphid year, this pest has on more than one occasion demonstrated a remarkable capacity to rebound. Growers would be wise to err on the side of caution and expect the soybean aphid situation in 2005 to more closely resemble events of 2003 instead of 2004. As is always the case with fluctuating insect populations, early and regular scouting will be the key to detecting infestations of soybean aphids in 2005. Current University of Wisconsin-Extension recommendations are based on an action threshold of 250 aphids per plant from the late vegetative through R3 growth stages, when populations are actively increasing.

BEAN LEAF BEETLE

In 2004, DATCP's pest survey staff conducted two separate surveys for bean leaf beetle and bean pod mottle virus (BPMV). The first took place in spring, between May 17 and June 10, and targeted overwintered beetles. The second survey, carried out between July 19 and August 24, targeted second generation beetles. In addition to assessing beetle distribution, beetles were collected and later processed using ELISA test kits to screen for the presence of BPMV.

2004 Spring BLB Survey Results

The first overwintered adults were swept from alfalfa fields in Rock and Walworth Cos. on May 17, marking the beginning of the survey. The survey was completed on June 10, as soybean seedlings began emerging and overwintered bean leaf beetles started to migrate to soybean fields. The objective of the spring survey for overwintered bean leaf beetles was to determine where beetles had survived the winter in Wisconsin. Although bean leaf beetle is a soybean pest, the spring survey was conducted in alfalfa fields, where overwintered bean leaf beetles feed in the springtime before soybeans emerge. At each alfalfa field the surveyors took 200 sweeps (50 sweeps in 4 separate areas) and saved any bean leaf beetles obtained in the sweeps.



The spring survey found overwintered bean leaf beetles at 64 of 101 survey sites located mostly in the southern three tiers of Wisconsin counties. When the overwintered beetles collected during the survey were later tested for the BPMV, beetles from 8 of the 64 sites tested positive. The BPMV-positive beetles were collected from sites in Jefferson, Lafayette, Walworth and Waukesha Cos. Spring survey results demonstrated that bean leaf beetles were able to survive winter months in the southern one-third of the state,

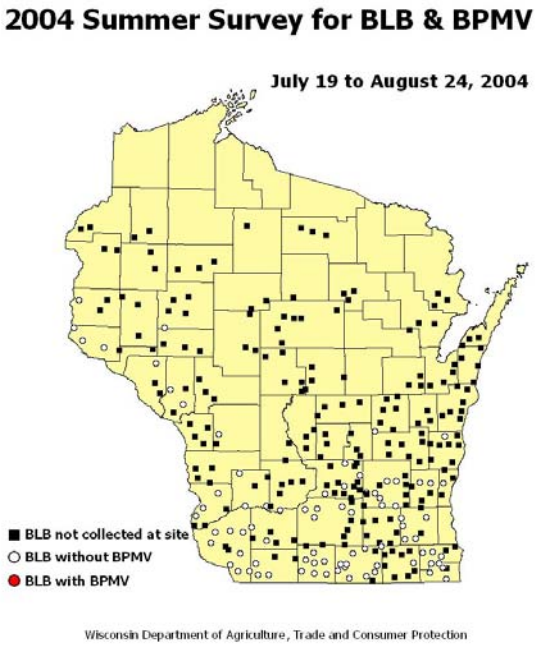
and that a very small percentage of that overwintered population were in fact carriers of BPMV. In turn, this indicated that BPMV transmission might be a problem for some southern Wisconsin soybean growers in 2004.

2004 Summer BLB Survey Results

The summer bean leaf beetle survey targeting second generation beetles got underway on July 19 and continued through August 24. As part of the survey protocol, staff collected beetles from 82 of the 293 soybean fields and measured bean leaf beetle defoliation levels. The 82 individual beetles were tested for BPMV using the same ELISA method used to test beetles from the spring survey; all tested negative for BPMV. In addition to the beetles, soybean leaf samples were collected from each of the 293 fields and tested for BPMV. No BPMV was found in any of the 293 soybean fields surveyed in 2004.

Outlook for BLB in 2005

Contrary to the above forecast, the bean leaf beetle did not develop into a significant pest in 2004. The same variables that suppressed in populations in general, cool temperatures and surplus amounts of rainfall, also helped to limit bean leaf beetle population growth. Results from the summer bean leaf beetle/BPMV survey suggest that early season growers should continue to closely monitor beetle activity both early and throughout the season, but that potential for early-season BPMV transmission need not factor into management strategies at this time. This, however, may not be lasting, especially if the general trend toward milder Wisconsin winters persists. In 2005 growers are strongly encouraged to regularly scout emerging soybean fields for bean leaf beetles and defoliation, especially early planted fields.



ALFALFA WEEVIL

2004 Survey Results

Alfalfa weevil, an insect that has been a relatively inconsequential alfalfa pest in recent years, made a surprising comeback during the spring of 2004. Adult activity resumed in late April, and spring-laid eggs began hatching near Madison by May 9. Larvae from overwintered eggs grew increasingly abundant throughout May, and by mid-month, 50%-60% tip injury larvae had become evident in hay fields throughout the southwest and south central districts. Compounding the larval pressure was the fact that alfalfa growth was delayed by temperatures that lagged 4-8 degrees below normal in late May/early June, and the record amounts of rainfall that fell in May prevented many farmers from getting into their fields to harvest first crop hay at the same time larval feeding was most concentrated. By early June, outbreak conditions had developed in a number of southern Wisconsin fields and tip feeding in many uncut fields far exceeded the threshold of 40%. A slight reprieve from the wet weather came around June 7, when farmers finally managed to cut first crop hay between the rain showers; however, by that time numerous fields were beyond harvest stage and most had been exposed to high populations of larvae for approximately two to three weeks longer than normal. Together these factors dramatically lessened the quality of first crop hay. When pupation began about June 16 near Madison, high

rates of tip feeding and heavy populations of larvae existed in some fields. Numbers of larvae in second crop regrowth began to decline due to pupation by June 25 and by mid-July larval numbers had decreased to less than 4/10 sweeps. In most districts the potential for damage had passed. Numbers were low during the balance of the summer and through October, and subsequent hay crops fared far better than the first. One reminder that might be derived from last spring's survey findings is that growers should not discount the alfalfa weevil simply because it hasn't been a major player in recent years. While heavy losses of the first cutting have become less and less common, under the right conditions populations do build rapidly, and chemical intervention may still be necessary on rare occasions.

POTATO LEAFHOPPER

2004 Survey Results

While some scattered hotspots were reported in the southern and northeastern parts of the state, on the whole, 2004 was not a noteworthy year for the potato leafhopper. Migrants began arriving around May 21, but because of unfavorable weather conditions, leafhoppers got off to a slow start. Consistent and heavy rainfall throughout May suppressed reproduction early on, keeping counts below 0.5 per sweep in the southern tier of counties throughout May and into early June. The first sighting of nymphs was reported on June 5 in Dane Co., but it wasn't until June 14-18 that nymph production in regrowth alfalfa really took off. In the south central district, counts of 0.8-3.2 adults/nymphs per sweep in 8"-12" fields were commonplace by mid-June. Although populations appeared to be rapidly and steadily increasing, wet conditions prevailed again around mid-month, effectively slowing a potentially damaging population of leafhoppers. Strong southerly winds over the July 4th weekend blew in more migrants, and by July 9, moderate to high populations could be found in many second and third crop alfalfa fields. Populations continued to build throughout July, and between July 16-30, conditions were the most ideal of the 2004 season for development and reproduction of potato leafhoppers. Despite escalating leafhopper populations, by early August most alfalfa acreage seemed to be faring well. Shortly thereafter evening temperatures began to decline, significantly slowing potato leafhopper reproduction by mid-August. Nymph production decreased considerably between August 13-20, and only light populations persisted through fall. Although some heavy populations developed in isolated southern and northeastern alfalfa fields, very little economic injury was attributed to this pest in 2004. Because potato leafhopper is a migratory insect, it's not possible to forecast its damage potential from one year to the next. In 2004 growers were fortunate to experience mostly low leafhopper densities, but that may not be the case in 2005. Growers with susceptible crops are encouraged to pay attention to low level jet stream activity that delivers potato leafhoppers into the state around mid-May, and to monitor the subsequent population build-up.