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AG CLEAN SWEEPS

The Wisconsin Department of Agriculture, Trade & Consumer Protection is once again organizing Agricultural Clean Sweep programs in cooperation with selected counties. The purpose of clean sweeps is to get unwanted or unused pesticides and other farm chemicals off of farms where they are a liability and a potential danger to the environment and to have them properly handled. Ag clean sweeps are free to farmers and offered to others at a reduced price. Since 1990, Ag Clean Sweeps have collected more than 1.5 million pounds of pesticides and waste chemicals.

Most pesticides are accepted at clean sweeps including: 2,4-D, 2,4,5-T, Atrazine, Captan, Chlordane, DDT, Heptachlor, Lindane, Malathion, Parathion, Toxaphene and many others. Chemicals that are accepted include acids, engine cleaners, lead paint, solvents, veterinary supplies, wood treatments and many others.

Not all materials can be accepted, however. These items include compressed gas cylinders, Freon 11 & 12, Infectious waste, explosives including detonators and blasting caps, and radioactive materials including smoke alarms.

Ag clean sweeps will accept unknown chemicals in small quantities (<50 pounds or 5 gallons). For larger amounts you must contact your county coordinator first. 30 and 55 gallon drums are accepted, but you must contact your county coordinator first.

Ag Clean Sweeps allow farmers to rid themselves of outdated and non-usable pesticides. It is best to rid your operation of these pesticides to reduce your exposure to them and to reduce the risk to emergency personnel should there be a fire at your pesticide storage facility.

1991 dates & locations

Wood County

June 9	Wisc. Rapids
Sept. 8	Marshfield
Oct. 13	Wisc. Rapids & Auburndale

Oneida County

By appointment between April and November. Call 715-282-4942 for an appointment

Northwest Counties

(Burnett, Rusk, Price, Sawyer, Taylor & Washburn)

Year round by appointment. Call 715-635-2197 for an appointment.

Teryl Roper, UW-Madison Extension Horticulturist

PESTICIDE STORAGE

Pesticide applications have begun on Wisconsin cranberry marshes. Even with careful buying some pesticide is typically remaining after an application. Sometimes it is more economical to purchase pesticides in larger quantities (but for no more than one season) and this material must be stored prior to use. Proper storage of pesticides is very important.

Pesticides should be stored in a facility separate from other equipment or materials. The facility should be on a concrete pad with a berm around it to prevent spilled pesticides from running onto and into the ground. Store pesticides in their original containers and store them to protect the packaging. Keep fungicides, herbicides and insecticides separate to prevent cross-contamination. Provide adequate ventilation for fumes to escape.

One major reason for storing pesticides in a separate facility is for fire safety. If the building where your pesticides are stored should catch fire the firefighters will stand by and let it burn. That is the safest thing they can do. If they spray the building with water pesticides may be washed into the soil or surface waters creating a huge (and expensive) cleanup project. If you store pesticides in your machine shed much valuable equipment might also be lost.

Pesticide storage facilities don't have to be huge. Yard barns are available at most lumberyards and home improvement centers. They are relatively inexpensive and when placed on a concrete pad they are very functional.

State rules for pesticide storage are found in ATCP 29.

Teryl Roper, UW-Madison Extension Horticulturist

ECONOMICS OF POLLINATION
Is renting honey bee colonies worth the money?

Ensuring adequate and reliable pollination of cranberries is critical for fruit yield and quality. Relying on wild populations of bees (bumblebees, feral honey bees, other solitary bees) may not always provide adequate and reliable pollination. Naturally nesting bumblebee colonies are not a reliable source of pollinators for cranberries, although when present, they are the most efficient of the bee pollinators. Most cranberry growers rent honey bee colonies to ensure proper pollination. However, there are questions about how many honey bee colonies to bring into a property and the timing of honey bee colony introduction. Although honey bees are effective pollinators of cranberry, some growers doubt the efficacy and necessity of renting honey bee colonies, especially during economically hard times.

The usual practice is to place 1-2 honey bee colonies per acre of cranberry property, and to leave the colonies for the duration of the bloom. This year, 2000, provided a unique opportunity to examine the effect of honey bees on cranberry pollination as many growers that usually rent honey bees colonies did not rent them due to yield restrictions. We compared yield, bee visitation, and pollen loading on stigmas at a property that brought in 2 honey bee colonies per acre with a property that did not rent honey bees. We also compared yield on the property that rented no honey bees this year with the yield of the same property in 1999 when the grower rented 3 colonies per acre.

Bees visiting flowers

In 2000, at the property with 2 colonies per acre, the highest levels of honey bee visitation and pollen collection by honey bees were seen during mid to late bloom (20% to 50% out of bloom). Bumblebee numbers were low but relatively constant throughout the bloom.

There were few bees visiting flowers at the property that brought in no honey bees. A few bumblebees but no honey bees were seen on the cranberry bed, although a few honey bees were seen foraging on clover alongside the bed. There was no apparent increase in wild bee pollinators with the absence of honey bees.

Pollen deposition

The property with 2 honey bee colonies per acre in 2000 had more pollen tetrads (the clumps of four pollen grains produced by cranberry flowers) present on the stigmas of the cranberry flowers during mid to late bloom (20% to 50% out of bloom) than the property that brought in no honey bees (Figure 1). There was no difference between the properties during early bloom (25% in bloom) when honey bee visitation and pollen collection rates were low.

Eight pollen tetrads is the minimum number required for fruit set in cranberries. Presently there is no available information on the number of pollen grains required for the best quality berries. Many of the stigmas at the property with no honey bees had 8 or more tetrads during early and late bloom, but there was a drop in the number of stigmas with more than 8 tetrads during mid bloom (Figure 2). The difference in the percentage of stigmas with more than 8 pollen grains between the property with honey bees and the property without honey bees was greatest during mid bloom. Even though rates of flower visitation where low throughout the entire bloom on the property with no honey bees, there may have been enough wild pollinators to effectively pollinate cranberries during early bloom, when there were not as many flowers. However, during mid bloom, there were too many flowers for the low numbers of wild pollinators to be effective pollinators. A large number of bees are needed at this time to ensure visitation of the majority of flowers. During late bloom, wild pollinators may again possibly provide sufficient pollination. Other possible causes of pollen deposition are wind and self-pollination. Self-pollination often results in abortion of fruit so these pollen counts may not reflect actual fruit set.

Yield

Cranberry yield was examined using three measures: 1) berry counts per 20 cm^2, 2) individual berry weights, and 3) weight of all berries in a 20 cm^2 plot. The weight of all berries in a 20 cm^2 plot is most closely related to the barrels per acre used by most growers to assess yield. However, individual berry weight is the best measure of the effect of honey bees on cranberry production because it does not confound yield with planting density.

In 2000, the cranberries were significantly larger on the property that brought in 2 colonies per acre than on the property with no honey bees (Figure 3). Also, within the same property, the cranberries were larger in 1999 when 3 colonies per acre were present than in 2000 when no colonies were rented (Figure 4). The owner of this property reported a 30% decrease in barrels per acre between 1999 and 2000 for the beds included in this study.

Conclusions

Good pollination results in increased fruit size and quality. Pollination of cranberries by honey bees increases the size of individual cranberries which may have a positive effect on fruit quality. It is clear from our study that honey bee pollination increases cranberry yield. Honey bees appear to make the biggest difference when cranberries are between 20% and 50% out of bloom.

The effect of not renting honey bee colonies will vary between properties depending on the numbers of wild pollinators in the surrounding area and differing management practices. Wild pollinators are most likely to be effective during early and late bloom, but their numbers may not be sufficient during mid bloom, particularly at larger properties.

Good honey bee pollination results in larger berries and higher quality fruit. Lack of honey bee pollination reduces yield, and produces smaller berries. Is renting honey bee colonies worth the money? If producing and purchasing large quality fruit are the goals of growers and consumers, then renting honey bees is worth the money. Growers can reduce yield by not renting honey bee colonies, but fruit quality will be compromised.

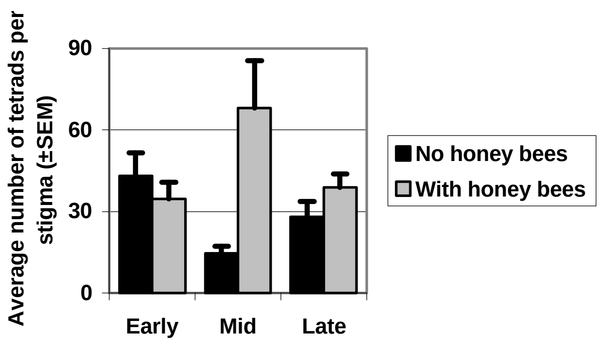

Figure 1. Pollen deposition. The average number of pollen tetrads on each examined stigma for different bloom stages (early bloom, mid bloom, and late bloom) for a property with no added honey bees and a property with honey bee colonies. $P<0.05$.

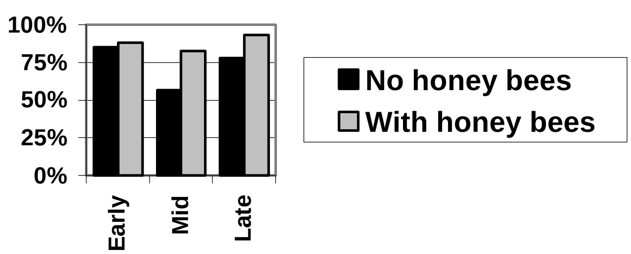

Figure 2. Percent of stigmas with more than 8 tetrads for different bloom stages (early, mid, and late bloom) for a property with no added honey bees and a property with honey bee colonies.

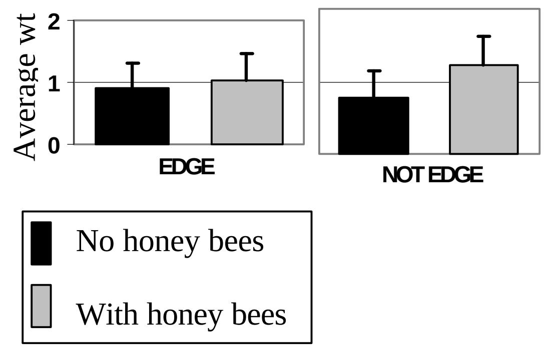

Figure 3. Weight of individual berries (average ± standard deviation) taken from the property with no added honey bees and the property with added honey bees. A. Average weight of individual berries from plots on edge of bed. ANOVA revealed a significant difference B. Average weight of individual berries from plots not on the edge of bed. ANOVA revealed a highly significant difference

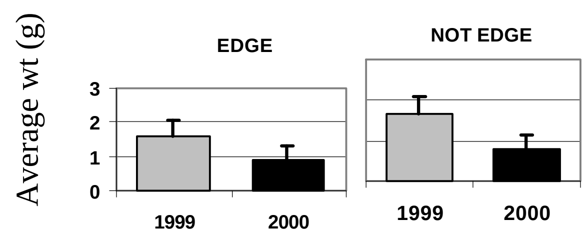

Figure 4. Weight of individual berries (average ± standard deviation) from the same property with added honey bees in 1999 and no added honey bees in 2000. A. Average weight of individual berries from plots on edge of bed. ANOVA revealed a significant difference B. Average weight of individual berries

Elaine Evans and Marla Spivak, Dept. of Entomology, University of Minnesota.

Note: This article was adapted from the 2001 Wisconsin Cranberry School Proceedings.

Never think you're not good enough yourself. A man should never think that. My belief is that in life people will take you very much at your own reckoning.

Anthony Trollope

FLOODING TO CONTROL BLACKHEADED FIREWORM

Growers have been using deep, brief floods in late spring to control blackheaded fireworm (BHFW) since the mid-1800's. The only alternatives to flooding in the 1800's were kerosene emulsion, Paris green, and the botanical insecticides tobacco and pyrethrum. Flooding was widely regarded as the best control method. Flooding was practiced until the 1940's when DDT became available. DDT was the most effective compound for insect control then available and was better than flooding

During the 1950's and 1960's many new synthetic insecticides became available and were widely used. Since then the number of synthetic insecticides has dropped. Resistance has also become an issue. Flooding has now taken on a new interest. This research was undertaken to evaluate reflooding as a control measure for BHFW.

Three marshes in the Warrens area were chosen for field trials in 1991. At each marsh two nearby beds were chosen. 100 BHFW eggs were located and marked. One of the two beds at each location was flooded to 3-10 inches above the vines. The duration of the flood depended on the level of dormancy of the vines, but ranged from 24 to 50 hours.

Table 1. Mean density of BHFW larvae found in 0.1m2 samples and corrected percent reduction of larval density resulting from flooding.

		Larval Density		
Site	Bed	Before	After	CPR
A	Flooded	36.3	3.7	89.4
	Dry	7.7	9.7	
B	Flooded	4.0	3.0	93.1
	Dry	0.7	7.7	
C	Flooded	43.3	12.0	78.7
	Dry	14.0	31.3	

The greatest reduction of larval density was on Marsh B, due in part to the continued hatch on the unflooded bed. Marsh A and C also had significant reductions of BHFW larvae density resulting from flooding.

Flooding generally will not eliminate BHFW populations it does cause considerable mortality. Flooding can be an effective preventative treatment when populations are near, but below, population thresholds. Flooding can also be used as a supplement to insecticides.

Depending on the dormancy level of the vines, some risk is associated with flooding. If a flood is held too long vine injury may result. The results are more harmful as water temperature increases and the dormancy of the vines decreases. The physiological response of vines to flooding has not been fully studied.

In an era of increased pests and environmental monitoring in IPM programs, we believe reflooding can have a role in controlling BHFW. In some cases flooding may be adequate by itself; in other cases it may be necessary to combine flooding with other pest management approaches.

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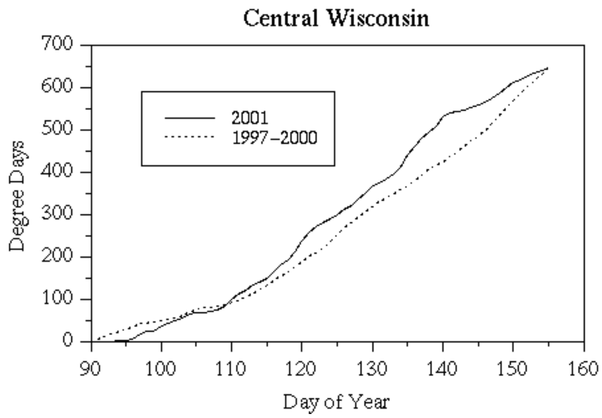
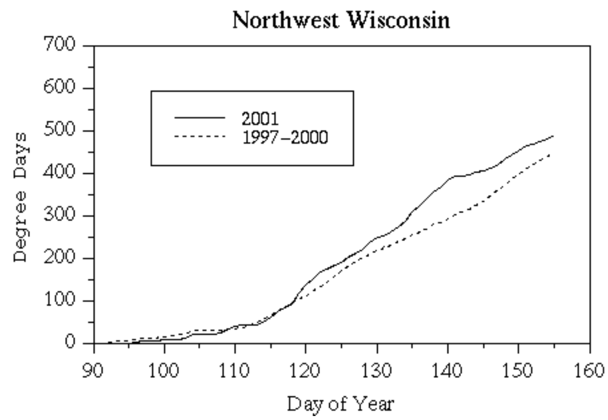
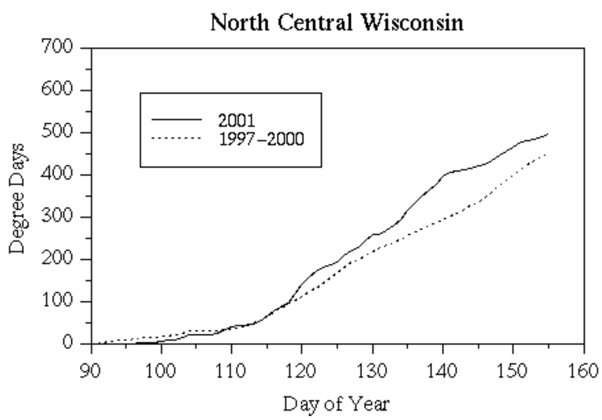
Note: This article was condensed from a manuscript in the 1992 Proceedings of the Wisconsin Cranberry School. More detail is available in the proceedings.

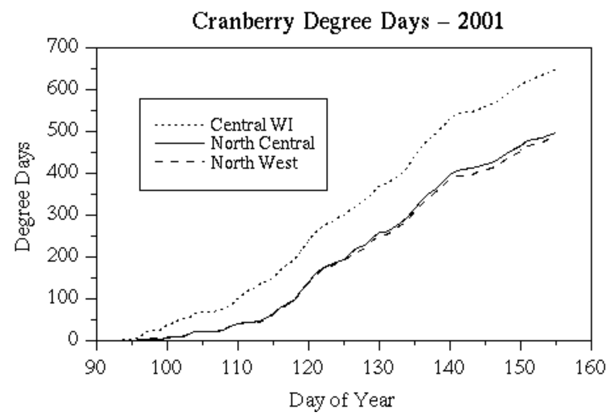
Edward Gibbon, in 1788 set forth in his famous book, "Decline and Fall of the Roman Empire," five basic reasons why that great civilization withered and died:

1. The undermining of the dignity and sanctity of the home, which is the basis for human society. 2. Higher and higher taxes: the spending of public money for free bread and circuses for the populace. 3. The mad craze for pleasure, with sports and plays becoming more exciting, more brutal and more immoral. 4. The building of great armaments when the real enemy was within—the decay of individual responsibility. 5. The decay of religion, whose leaders lost their touch with life, and their power to guide the people.









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