SANDING

Sanding and pruning are long standing cultural practices. They are thought to invigorate the vines and increase yields over the long term. The typical sanding practice is to apply 1/2 to 3/4 inch of sand on the ice in winter on a 3 to 5 year rotation. Sanding covers the duff layer and encourages rooting along the woody runners that are covered. Sanding can aid in managing pests such as cranberry girdler, tipworm and fruitworm which overwinter as pupae in the duff layer. Yields the year following sanding are usually reduced, but in subsequent years yields are higher than in unsanded beds.

Pruning removes a fraction of the uprights causing branching and increased growth in the uprights and vines that remain. Removing excess uprights allows greater light penetration into the canopy leading to increased production from remaining uprights. Like sanding, pruning reduces yields the first year, but enhances yields later and has the additional option of being able to sell the prunings for new plantings.

While some scientific sanding studies have been conducted in other growing areas, no such research has been reported under Wisconsin conditions. This research was to evaluate pruning and sanding alone and in combination to understand their effects under Wisconsin conditions.

Materials and Methods

The research was conducted on a mature 'Searles' bed at Norris and Son Cranberry Company in Cranmoor from 1991 to 1993. Treatments imposed were as follows:

1. Sanded and pruned
2. Unsanded and pruned
3. Sanded and unpruned
4. Unsanded and unpruned

Plots were pruned by about 14% in the fall of 1990 with a drum-type pruner. Subsequent upright counts showed the pruning did not discriminate between fruiting and vegetative uprights, removing and equal portion of each. Sanding plots received 1/2 to 3/4 inch of sand over the winter ice.

Each year between 1991 and 1993 samples were collected from the plots prior to commercial harvest and the yield, berry number and mean berry weight measured.

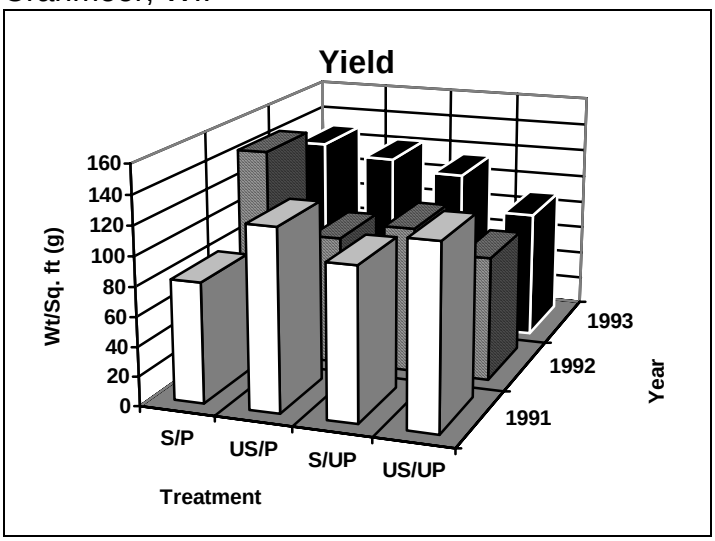
Results

The year treatments were imposed sanding and pruning reduced yields compared to unsanded treatments. Sanding without pruning was not different than the unsanded treatments (Fig. 1). Pruning alone was no different than the unpruned treatments, but pruning combined with sanding reduced yields. Yields increased in years 2 and 3 for the sanding/pruning treatment, while they decreased in years 2 and 3 for the unsanded/unpruned treatment. Sanding without pruning had similar yields all three years while pruning without sanding reduced yields in year 2.

Berry number per square foot parallels the weight per square foot (Fig. 2). The year of treatment berry number was significantly reduced in the plots that were both sanded and pruned. The sanded/unpruned plots were lower than the unsanded plots, but not significantly so. In the second year, the sanded/pruned plots had the highest yields. The remaining treatments were

not different than one another. The third year berry number was higher in all plots than the unsanded/unpruned treatments.

Figure 1. The effect of sanding and pruning treatments on yield of 'Searles' cranberries in Cranmoor, WI.



When examined by year, berry number follows the same pattern as yield. The only difference was for the unsanded/pruned treatment where the second year had fewer fruit (Fig.2).

The treatments did not have any effect on the size (weight) of individual fruit. None of the bars in Figure 3 are different from one another.

Discussion

The treatments had a significant multi-year effect of cranberry yields. As expected, the two sanded treatments had lower yields than the unsanded treatments the year of treatment. The following two years the sanding plus pruning treatment had the highest yields. By the third year pruning or sanding or both were better than unsanded and unpruned. This suggests that functionally sanding and pruning are very similar.

Final yield is affected by berry number and berry size. Pruning and sanding affected fruit number, but not berry size. This suggests that fruit set (fruit #/flower #) was also affected, although it wasn't measured.

Figure 2. The effect of sanding and pruning treatments on berry number per square foot of 'Searles' cranberries in Cranmoor, WI.

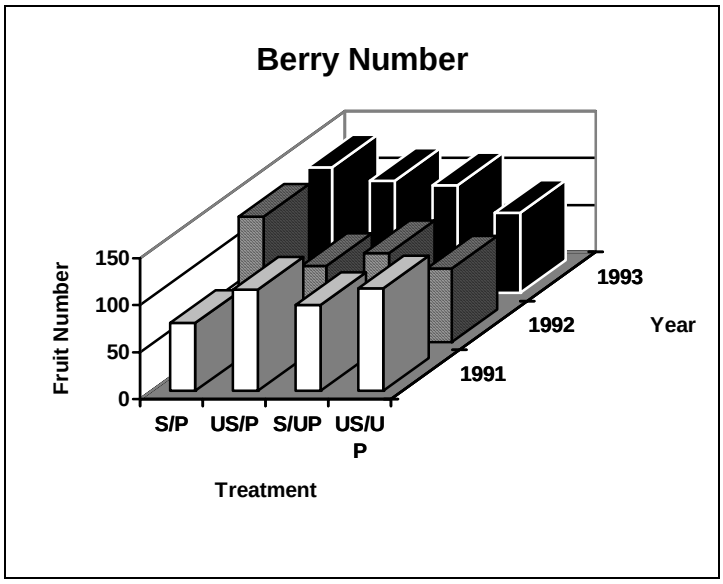
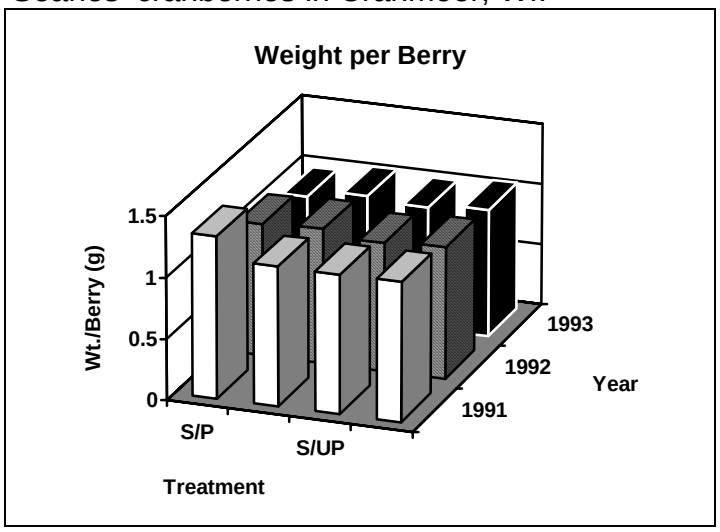


Figure 3. The effect of sanding and pruning treatments on mean berry size (weight) of 'Searles' cranberries in Cranmoor, WI.



The participating grower estimated the costs per acre of the treatments. However, the cost of stockpiling the sand was not included so the actual costs are underestimated. Table 1 shows the costs per acre and a gross estimate of expected returns given the increase in yields over 3 years.

Table 1. Estimated costs and returns of pruning and sanding treatments for 'Searles' cranberries in the Cranmoor region of Wisconsin, 1993.

Treatment	Net return /A	Net return /25A
Control (no costs)	0	0
Sanding ($156/A)	$482	$12,050
Pruning (743/A)	$743	$18,575
Sand+prune ($225/A)	$1515/A	$37,875

Based on the data collected in this study it appears that both sanding and pruning are cultural practices that will potentially increase yields for at least 3 years following treatment. While the physiological reasons for the increases in yield are not completely understood, the benefits of sanding and pruning are well demonstrated.

Leroy Kummer, Ocean Spray Cranberries

True liberty consists in the privilege of enjoying our own rights, not in the destruction of the rights of others.
George Pinckard

END OF THE SEASON? DON'T FORGET THE BUGS!

At the end of the season we sometimes forget about scouting for insects. I have to admit that there are a lot of things to distract you from looking for bugs or their damage. First, there is all the work that's necessary to prepare for harvest. Then comes the hectic period of harvest itself. And, of course, there's quite a bit of post-harvest activity as well. Also, the change in seasons can provide with some rather unfriendly weather this time of year. So, once the crop is in, and the equipment is all cleaned and repaired, it seems as though you should be able to sit back and relax a bit; after all, it *has* been a long season. And, of course, it's getting too cold for bugs -- they're all looking for warm, cozy places to hibernate for the winter. But this is actually a pretty good time to think about insect problems, and to start formulating ideas for next season. I think that there are three good reasons for spending a little time yet this fall on pest management.

First, this is actually a good time to find damage that you might not have seen previously. For example, often times cranberry girdler damage isn't really seen until the spring following the year of damage; that's when the big dead spots really show up. But the stress put on the vines by the root damage caused by girdler, white grubs, and other soil insects can often be seen in the late summer and fall. The symptoms may be subtle at this time, maybe nothing more that a subtle discoloration of the foliage or an apparent stunting of growth. But to the observant eye, these are signs of poor plant health. Further investigation in autumn may point to the cause, whether it be insect or not, which will help you better develop your plan of action for the following year.

Fall is also a good time to assess the impact of tipworm. If you had a significant infestation, you can check the overwintering buds of the regrowth to determine what percent appear to be vegetative or flowering for the following season.

A second reason why fall is a good time to assess insect activity is because you can decide what impacts on yield were caused by insect activity during the year. Did you end up with an unacceptable level of raisins or mummies that were caused by fireworm, fruitworm, or sparganothis? If so, do you know what insects were the culprits and the time of the year the damage occurred?

Finally, a third reason to consider your insect problems during this time of the year is because they are still fresh in your mind. If you had some specific, serious problems, this is the time to review the circumstances and try to develop some solutions for future years. If you contract with a pest management consultant, the fall provides a good time to meet to discuss the previous season and plan for the next year.

Not all insect pest problems can be directly related to the situation in the previous year, but many can be. It's easy this time of the year to put aside thinking about bugs, but I suggest that it is wise to spend just a little more time. We *will* have some periods of (relatively) nice weather after harvest; walk your beds and see if you see things out

of the ordinary; if so, try to determine the cause. And, on one of those really ugly cold, wet (white?), windy days in November, spend a little time by the fireplace reviewing the year from an entomological perspective, and start to develop plans for 1995. Contrary to popular opinion, bugs don't *always* have to be one step ahead of us.

Dan Mahr, Department of Entomology

The grand essentials to happiness in this life are something to do, something to love, and something to hope for.

Joseph Addison

QUESTIONNAIRE ON COMPUTER USAGE

We are continuing our work on the development of Cranberry Crop Manager computer software (CCM). As we are developing this package, we are trying to make it as useful as possible to as many people as possible. Therefore, we have enclosed a survey with questions about the usage of computers in your business as well as the potential ways you may wish to use CCM. Please take a few minutes to fill out the questionnaire and return it so that we can develop a better product to help you.

Dan Mahr, Department of Entomology
Paul Karaakka, Extension IPM Program

PESTICIDE STORAGE

With harvest approaching or underway most growers are finished applying pesticides for this growing season. Once harvest is finished it will be a good time to think about properly storing remaining pesticides through the winter so they will be efficacious next year.

Most growers use existing buildings to store pesticides. However, if you mix and load large quantities of pesticides, consider building a dedicated facility. Plans for these buildings are available through your county Extension office.

If at all possible, locate your pesticide storage facility downhill and downwind from your beds and sensitive areas such as houses, play areas, and surface waters. Since this is seldom possible on cranberry marshes, locate it as far as possible from surface waters and isolate it as much as possible. Take care to prevent the possibility of contaminating streams, ponds or reservoirs should a spill or fire occur.

A pesticide storage facility should have a cement floor that is impermeable and easy to sweep or wash. The area should be well lighted and ventilated. Never allow pesticides to become overheated and do not store them close to any heat source. An electrically shielded, exhaust-type, ventilating fan may be needed in the storage area to maintain temperatures at acceptable levels and to reduce the concentration of toxic fumes. Smoke alarms or carbon monoxide detectors should also be installed.

Protect stored pesticides from freezing. Ideally, a storage facility should be well insulated and sufficient heat provided to keep the temperature above freezing. Some pesticides (particularly liquid formulations) will break down or separate, making mixing difficult or impossible if allowed to freeze.

Store herbicides, insecticides and fungicides in separate areas, if possible. Volatile herbicides may contaminate other pesticides if the containers are not securely sealed.

Store dry chemicals such as powders and boxes on pallets or shelves to keep the packages dry and the labels legible. Don’t store dry materials on shelves below liquids. Any liquid spills would contaminate lower dry chemicals. Metal containers should be placed on pallets over the winter to keep them dry and to prevent them from rusting.

Always store pesticides in their original containers; labels should be intact, legible and plainly visible. Check stored materials periodically to make sure the containers are secure and the labels are still legible. Don’t transfer pesticides to another container that held a different product.

When pesticides arrive on the marsh, mark the date of purchase or delivery on the container.

This will help you rotate your stock. Most manufacturers recommend a shelf life of no more than 2 years. Once a package is opened, the shelf life is substantially reduced.

Make sure your pesticide storage area is secure. This will reduce the risk to family members and unauthorized employees, but will also reduce the chance of injury or theft. Make sure animals can't get to stored pesticides either. Don't store feeds, seed or baits in the same area with pesticides.

Mark the exterior of the storage facility clearly that pesticides are stored inside. This will deter people who shouldn't be in the facility and will help emergency response personnel in the case of a fire or flood. Placards are available commercially.

Storing pesticides properly through the winter will ensure they are effective next year. Storing the alone in a dedicated facility gives you greater management flexibility and will protect other farm assets if there were a fire. Storing pesticides alone just makes good sense.

Adapted from "Pest Management Principles for the Commercial applicator--Fruit Crops"

FIELD NOTES

Some items crop consultants have noticed in the field recently include that N-deficient beds turn red first. Fruit are coloring very well encouraged by warm sunny days and cool clear nights. Frost protection was a common occurrence in August, but was less common in September.

Cankers on cranberry vines have been found in locations where they had previously not been seen. Some suggest that the injury was brought on by the cold weather in January 1994. On the other hand, damage is found on vine sections that are 3 years old. No specific cause is yet known.

Upright dieback has been noticed this year on both Stevens and Searles. It remains to be seen how serious of a problem this has become for 1994.

No man has a good enough memory to be a successful liar

Abraham Lincoln

1995 CLEAN SWEEP COUNTIES

Approval and funding has already been approved for some clean sweep sites for 1995. If you have pesticides that are no longer used or labeled for cranberry, seriously consider taking these materials to the clean sweep in your county. For more information about a pending clean sweep in your area contact your county Extension office. Counties participating in Spring 1995 (April, May, June) are:

Brown	Pepin
Dunn	Sheboygan
Jackson	Taylor
Langlade	Winnebago
Outagamie	

The following counties will participate in summer 1995 (July, Aug. Sept.) clean sweeps:

Crawford	**Marathon**
Dane	Polk
Grant	Racine
Jefferson	St. Croix
Lincoln	Vernon

One change for 1995 is that two sets of counties will work together in each session with mobile collection sites (perhaps 4-6 in each pair) to make drop off easier. These pairs are Dunn & Pepin and Marathon & Lincoln.

What do we live for if it is not to make life less difficult for each other.

George Eliot

Wisconsin Cranberry School Scheduled

The 1995 Wisconsin Cranberry School is scheduled for March 15-16 at the Sentry World Theater in Stevens Point. The focus audience of the school is the marsh managers; those who make decisions about how the marsh will be run. We look forward to seeing you there.

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LAST 1994 NEWSLETTER

This is the last Wisconsin Cranberry IPM Newsletter for 1994. We hope it has been informative and helpful to you. We welcome suggestions for improving the newsletter including topics you would like to see addressed or format changes.

If the funding groups are willing again in 1995 we will publish Volume IX. We appreciate the crop consultants who faithfully provided articles and trap count data to make the newsletter successful. Thank you to those who have sent address change cards. It makes it much easier to make sure every Wisconsin marsh receives a copy.