Cooperative Extension
Coastal Washington Research & Extension Unit
Long Beach, WA 98631

CRANBERRY VINE

February 1997

MEETINGS

Long Beach Cranberry Farm Tours. There will be a farm tour each month, February through May, beginning with a tour of the McPhail farm on February 27 at 9:00 a.m. Remaining tours will be held on March 27, April 24, and May 29; locations will be announced.

Pesticide Disposal. The WSDA will have an unused pesticide disposal pickup on March 12 in Raymond. Growers must be prescheduled. Call 360-902-2050 for more information. Any grower with pesticides no longer registered for cranberries or pesticides that they never intend to use should take advantage of this opportunity. There is no charge and you will save tens of thousands of dollars over disposing of it on your own. There is no excuse to continue to hold onto pesticides that are not needed.

Cranberry BMPs. These documents are critical for survival of the cranberry industry. Find out what has happened, what has been passed, and what we are proposing. April 14, 7:00 pm, North Willapa Grange, Grayland; April 15, 7:00 pm, Ocean Spray Receiving Plant, Long Beach. Pesticide credits will be given.

"Life and Death in the Ditch". Dale Davis, and Kahle Jennings, Washington Dept. of Ecology, and Dr. John Stark WSU - Puyallup. Reports on pesticide sampling, aquatic bioassays, and aquatic biodiversity studies of the Grayland drainage ditch, March 24, 7:00 pm, North Willapa Grange, Grayland. This meeting will be your chance to hear from the horse's mouth what has been found during the past 2 years and what it really means to you as growers. (Note: this program will be presented in Grayland only.) Pesticide credits will be given.

WEATHER

	Rainfall (Inches)					Growing Degree Days				
Month	1997	1996	1995	1994	20 yr av.	1997	1996	1995	1994	10 yr av.
January	14.93	9.8	14.9	8.1	10.8	43	51	108	76	40
February		13.1	7.4	12.1	9.3		86	84	26	55
March		3.4	8.3	6.4	9.5		108	90	137	72
April		12.9	7.4	5.6	5.6		190	133	164	116
May		4.3	2.8	3.4	3.8		231	280	276	216
June		1.8	3.0	2.9	2.8		315	372	340	323
July		1.6	0.9	0.7	1.9		460	516	440	421
August		1.0	1.6	1.4	1.7		440	418	503	440
September		2.7	3.9	1.8	4.1		385	514	439	363
October		11.5	10.0	8.5	6.5		245	268	171	217
November		14.2	17.3	17.0	11.4		67	183	25	99
December		18.4	13.7	17.6	12.6		20	82	15	41
TOTAL		94.7	91.2	85.5	80.5		2598	3048	2612	2402

WEED CONTROL

Stinger. This compound has given outstanding control of lotus, aster, and clover at rates one-half the label rate. I have submitted Section 18 applications for Stinger in Oregon and Washington so that we can get rid of these weeds once and for all. This was done prior to the new Food Quality Protection Act which was passed and signed into law on August 3, 1996. It was hoped that we would get a second year Section 18 on this compound for weed control in time to start using it by November 1996. That time has long since passed. The lack of progress on this Section is a result of how this new act changes requirements for a Section 18. Without going into much detail, it basically makes it more difficult to get a Section 18. At this time, the fate of that submission is still unknown. Growers cannot use Stinger on new or bearing cranberry bogs without approval of that Section 18. You will be notified immediately if and when the Section 18 is approved.

Growers interested in further issues of the Food Quality Protection Act and other agrichemical and environmental news should subscribe to the Agri-Chemical and Environmental Newsletter put out by Alan Schreiber at the Food and Environmental Quality Lab, Washington State University. To subscribe, contact Eric Bechtel, FEQL, WSU, 100 Sprout Road, Richland WA 99352-1643; phone: 509-352-7378. This is an excellent newsletter containing highly relevant information on pesticides and related environmental issues.

Post-Emergent Herbicide Use During Winter. It should be stressed that there are only three post-emergent herbicides approved for use on cranberries. These are grass herbicides--Poast, Fusilade, and Select. These compounds can be used as an over-spray. Only Poast can be used on bearing bogs. Key to spraying grasses in the winter is that the grass be actively growing. Spraying tissue that has died back or that has some residual chlorophyll but has no active growing point is not likely to result in control. The products must also match the susceptibility of the grass. During the winter months, annual bluegrass is one of the more common actively growing grasses. This is frequently misidentified and consequently sprayed with Poast or Fusilade and, therefore, not controlled. Only Select will control this grass. Because of cold temperatures, burn down in the winter, or any visual control in the winter may take much longer than in the summer.

Surfactants. Several growers are using the new organosilicants as a surfactant in herbicides to enhance rain fastness of products like Roundup. It should be noted that when using this product, eye protection is required as organosilicants such as Silwet can damage the eye membranes.

Iron sulfate. For new plantings that have a large amount of moss growth and liverworts, the most effective control measure is the use of iron sulfate. There are several water soluble iron sulfate products available. They should be used at about 40 lbs active ingredient per acre. This is about 200 lbs of a 20 wp product per acre. Application time has to be before any new growth on cranberry tips, otherwise the cranberries will be damaged. As long as the cranberry vines are dormant, they are quite tolerant of iron sulfate. Products can be applied as a spray or drench and will do a good job of killing any moss that they actually contact. The granular iron ammonium sulfate products are another contact kill product but because the granules are large, they have poor overall contact and do not control mosses very well. The granular products, however, do an adequate job on liverwort control. They should be used at about 20 lbs active ingredient per acre, again, prior to any cranberry growth. I don't recommend use of iron sulfate on established plantings because I have never shown it or the control of moss to have any effects on yield or lasting effects on moss control, therefore, change in the moisture status of the bog will usually bring about better long-term control of moss than the use of iron sulfate. Moss and liverworts can, however, seriously hamper the growth and rooting of new vines on a 1-2 year old planting and should be controlled to maximize early production.

Buttercup Control. Mid-winter is the ideal time to control buttercup. Apply 100-150 lb Devrinol 10G (higher rate for bad infestations on peat soils) in early to mid-February. If Devrinol is applied later than this or at lower rates, control often is marginal. Sites with buttercup normally have silverleaf as well; thus, split Casoron applications in March and April are usually needed to keep the other weeds, like silverleaf, out.

Silverleaf Control. Nothing great has arisen for silverleaf control. We have done a lot of work and

have decent control, but not perfect. If you need a detailed copy of my silverleaf control results, give me a call. In general, split Casoron:2,4-D (5:1 ratio) applied when the first silverleaf tips are emerging in early March and then in April is advised. 2,4-D is not absolutely necessary but usually helps some. Exact rates and timing depend on soil type and variety. For McFarlin on peat or muck, 60 lb of the combination in early March and mid-April is good. For sandy soil or Stevens, the second application should be earlier and possibly lower. We have had even better control by adding Devrinol to the above mixture or by itself at the end of the pre-emergent herbicide season (mid- to late April). However, I am hesitant to recommend it without one more year of testing. Call me if you want to experiment. One significant feature of silverleaf control is improving drainage. Time and time again I see the most severe phytotoxicity in low, poorly drained areas. To use the heavy rates of herbicides needed for silverleaf control without damaging vines, good drainage is essential.

Arrowgrass Control. No great ideas on this weed. 2,4-D G after the vines are dormant in November and again in April (20 lb product/application) suppresses the spread.

Lily Control. Rock salt has done a fairly good job of killing lily. Because of potential vine damage, however, I can only recommend it as a method of getting rid of small areas of lily before it spreads.

New Beds. For new plantings on sand with high weed pressure, we learned several important facts this last summer. 1) Use of clean sand was great for new plantings but, based on our data, at least 2-4" should be used to prevent germination of seeds from under the sand. 2) A single application of Devrinol 10G even at high rates (80 lb/Ac) in mid-May usually failed to provide satisfactory weed control past June. Combining Devrinol with Evital, however, provided control into August for most weed species. It appeared that Evital applied in early May was the best overall timing (compared to late May or June) but did not hold back the major onslaught of willows in August. The later applications (June) caused some growth reduction on vines, especially on sites that were too wet. 3) The minimum rate for Evital needed for weed control on sand appeared to be 20 to 35 lb. This gives good weed control with less chance of phytotoxicity. 4) Overwatering new beds compounds herbicide phytotoxicity and decreases weed control. Don't go overboard. 5) Sand type affected herbicide efficacy. New beach sand or dune sand (Bandon or Long Beach) requires less Devrinol to achieve weed control than sand dredged from an irrigation sump. In other words, Devrinol at low rates on a new bed with dredged pond sand provided lousy weed control.

BOG MANAGEMENT

Selection of Vines for New Plantings. Growers should consider several factors when selecting vines outside of the obvious one of high production. The evaluation of genetic purity is now available through DNA fingerprinting. Growers wanting to be assured that they are getting true Stevens or Pilgrim, etc. can submit vine tissue samples to Nick Vorsa at Rutgers University in New Jersey. Please call me if you need more information. By using this test you can be assured that you are getting what you are paying for.

Another consideration for vine sources is the absence of weed seeds. It is amazing to see how many weeds come in on vines that look apparently clean. Therefore, it is important to assure that your vines are as clean as possible. Similarly, vines are also a source of blackheaded fireworm eggs, which become a potential problem when they hatch and are not monitored. Inquiries should be made as to prior infestations with fireworm.

Another problem I frequently see is just the general low quality of the vines. Vines that have been stored too long, bailed too long, and/or have become too dry do not have the vigor of freshly cut vines and can make a year's difference coming into full production.

If you are getting vines from different sources, it is important to keep them separated in your own beds so that if removal is necessary at a later date, it will be possible. If they are all mixed up, you must live with any mistakes you have made.

New Planting Management. The two most common problems I saw this year on new plantings are related to over irrigation, poor drainage, and poor weed control. Frequently all three are related. When designing a new cranberry bed, it is critical that provision be made for rapid draining of surface water. Low spots with standing water normally are not conducive to good cranberry growth and tend to

accumulate herbicides and numerous other problems. Sanding these spots at a later date is usually necessary, but it doesn't always solve the problem. Therefore, it is important to get it right in the beginning. Drain tiles often will be needed to accomplish adequate field drainage. Over-irrigation on new plantings is also very common. Growers frequently irrigate one-half to one hour every morning on new plantings regardless of the evapotranspiration demands. As a consequence, the soil is too wet for maximum growth as it is almost always in a state of saturation. This not only reduces nutrient availability and soil oxygen but interacts with the effectiveness of herbicides. The wet areas tend to have poorer weed control and greater phytotoxicity than areas that are well drained and not over-irrigated. Therefore, just as it is important to not let the soil dry out on new plantings, it is more important to not keep it too wet. It pays to know the actual water needs of the plant you are using to convert this to evapotranspiration rates. Those of you who are using the automated weather station information, note that there is an evapotranspiration value given every day and this can be converted back to amount of irrigation on a cranberry farm.

One of the most interesting results from this last summer's research trials on controlling weeds on new plantings on sand was the site where there were parts that were well drained and other parts where the sand stayed saturated all summer (although there was no standing water at any time). Growth in the dry area was double that in the wet area, there was good weed control, and there was no phytotoxicity from the moderate to high rates of herbicides applied; whereas in the wet site, all the herbicide treatments we evaluated caused reduction in growth. In addition, this area also had more weeds. One of the best indicators for over-irrigation on new plantings is the weed species that come into a new area. If there is a preponderance of moss, liverwort, or marsh St. Johnswort, it is likely that this site is too wet and you need to cut back irrigation. New plantings on peat soils do not usually need prolonged daily irrigation. While it is true that on hot days you can get very rapid drying of sandy soils and heat stress, it is equally true that over-irrigation can cause just as much damage.

Sanding. Numerous studies have been conducted over the last 50-100 years concerning the efficacy of sanding in promoting vine productivity. In addition, it is commonly thought that when beds have been freshly sanded, Casoron should not be used that year. There are recent data from Bernadine Strik and Art Poole in Oregon which suggest that heavy sanding could be detrimental to productivity. I have been conducting sanding studies for 2 years, looking at the interaction between sanding and herbicides. So far, I have failed to see obvious yield responses to sanding and I have also failed to see any interactions of sanding and herbicides, i.e., sanding combined with Casoron did not reduce yields over that of sanding alone, compared to the check. This was true across numerous farms on both Stevens and McFarlin; therefore, it is hard to come out as a great advocate of sanding for all purposes. However, when vines have not performed well, lack vigor, do not have well established root structure, or have girdler damage, sanding is usually an ideal choice for improving the situation.

Vole Control (adapted from an article by Glenn Dudderar in The Great Lakes Fruit Growers News, Nov. 1996). Voles can be a problem on cranberry farms since nothing is registered for vole control within the beds. Therefore, only bait station dispensing off the beds can be considered. Look for runs in the beds to help identify the problem. Because meadow voles range over 0.15 acre to 1 acre, several bait stations should be used around a bed. It is not necessary to treat the entire area, but only those edges adjacent to meadow vole habitat (wild hay, unmowed meadows, bushy areas, etc.).

There are several types of stations. 1 to 1.75 inch PVC pipe constructed in an L-shape or upside down T-shape makes an excellent bait station. The horizontal pipe should be at least 12 inches long so that bait does not spill out the end and so that it will stay dry.

Place bait in pipe in the winter when food is scarce. Remember, zinc-phosphide baits should not be reapplied within 90 days of a previous application because voles become bait shy due to its fast action. Fill the tube no more than 1/4th full with bait if the tube is closed at one end. If the tube is open at both ends, coat the bait to the side of the tube with an adhesive such as syrup. Remove uneaten bait from stations. Dispose of bait properly.

Replanting Weak Areas. There are, all too often, numerous empty spots within productive vines due to loss from weevil, poor drainage, etc. Most growers

find these areas difficult to reestablish and often replant numerous years before finally achieving success. Some growers remove all the old soil and start with new; some use Pilgrim in these areas because it has excellent vigor; some use rooted plugs of cranberry vines. Rooted plugs spaced about 1 ft apart, already have a good root system and tend to take off quite well under most conditions. In the last several years we have intentionally induced herbicide stress and evaluated the growth of rooted cuttings compared to vines that have been disked in. In all cases, the rooted cuttings did the best. Usually the disked vines failed to grow at all. One of the additional factors we looked at was drenching the rooted cutting in activated charcoal. This protects the area around the roots from excess herbicide residual in the soil. We also looked at adding small amounts of slow release fertilizer underneath the root ball. To date we have not seen a tremendous advantage from using activated charcoal. The slow release fertilizer seems to have a slight benefit. The activated charcoal dip would be recommended only in cases where you know you have excess amounts of herbicide residue in the soil.

Pollination Ecology. Good pollination is a key to consistent production. Poor pollination along with poor frost protection are the major reasons for a bad year. Bees don't forage at temperatures below 55°, in the rain, or when it is windy. Therefore, as you know, if we have too much of this type of weather during bloom, we can have a poor crop year. To help compensate for that, the use of bumble bees as a supplemental pollinator to honey bees is advised. Managing feral bumble bees, as I have stated before, is not easy. Buying commercial bumble bees, however, usually is not cost effective.

To help solve this problem, I recommend several things. 1) Become an observant bee biologist. Take notes each year (February to June) on which bee species you are observing on which plants and what sort of densities you are noticing. From this, you should be able to get a feeling for the relationship of bumble bees on the indicator plant in March, April and May to the number of bumble bees on your cranberry beds. If you notice few bumble bees, then order extra honey bees. I have color keys of the bumble bees, if anyone wants one. Normally you can say that the population of bumble bees of a given species in a given season is almost entirely dependent on weather for that spring. A prolonged wet and cold spring is extremely harsh on bumble bees and it is highly likely there will be a major crash in that population. Hence in springs like this, growers relying on bumble bees for significant pollination of their crop should consider ordering more honey bees in order to compensate for that loss.

2) Consider planting bumble bee resource plants. Now is a good time to plant certain heather species around your farm. Some of the winter blooming heather species in particular, which bloom from January to May, are a very unique plant in providing ideal resources for most of the bumble bees in our area during the winter months. Species to plant include white and purple blooming heather (most *Erica x darleyensis* and *Erica carea* varieties) and Alba, springwood white, Furzey, etc.

Management of Neotropic Migrant Land Birds on Cranberry Farms. The majority of bird species that spend spring and summer in the woodlands of the Pacific Northwest are classified as neotropical migrants, spending the winter months in Mexico and Central America and in the spring traveling to North America to breed. These include warblers, flycatchers, hummingbirds, thrushes, and swallows. Because of loss of habitat in the tropics, the populations are rapidly declining. It is important, therefore, as cranberry growers to do as much as possible to preserve habitat that can be used by these birds. There are several things growers can do, including leaving old snag trees for cavity-nesting birds such as swallows and wrens. They also provide good substrate for invertebrates which are the food for these species. There is a close association between these species and the riparian areas, i.e., the vegetative community along our ponds, ditches, and creeks. These shrubs create small patches of habitat for birds escaping from predators as well as nesting and feeding opportunities. Some growers also have used swallow nests hung on wires between poles and trees to accommodate tree swallows. These birds can have an impact on the control of adult mosquitoes, girdlers, and fireworm populations on and near cranberry bogs. I have publications on building nesting boxes and restoring habitat for these species if anyone is interested.

Water Quality. Because cranberry bogs are usually associated with hydric (wetland) soils under reducing conditions (waterlogged), there is frequently a high amount of iron in the pond water which is used for

irrigation. Many growers can testify that use of this iron rich water can result in discoloration of fruit at harvest and a residue on the leaves which is likely to reduce photosynthesis and perhaps overall productivity. The solution to that problem has not been an easy one. Many growers have gone to pond aeration to help oxidize the iron and allow it to precipitate on the floor of the pond as opposed to on the fruit and leaves in the bog. I have been studying ponds that have been aerated for three years comparing the amount of iron, etc. with those not aerated and can detect some differences in water quality. Many growers swear by the efficacy of pond aeration in terms of reducing the amount of residual iron on the fruit. From a purely chemical point of view, the effects are less than dramatic as the water color is still far from clear. Some of the new aeration systems which use ozone generators and hooked to air compressor pumps also can have similar effects in terms of oxygenating the water. An evaluation this summer comparing ozone enriching pumps with regular water displacement pumps resulted in no discernible differences between the systems. In fact, since ozo-nation aerator pumps are more expensive than normal aerators, I cannot recommend them at this time. The only treatment that has been entirely successful in cleaning up the water to swimming pool standards has been the use of flocculants and coagulant aids added in the summer, with the combination of an aerator to help in mixing these compounds within the pond. These flocculate all the iron organic particulates and they settle to the bottom. The clearness will last up to 6 weeks and then gradually return to a more cloudy state. This treatment, however, is not very cheap. It runs to several hundred dollars for a single treatment in a small pond. It is also very complex in terms of requirements for the flocculants and coagulants needed at each pond, as they all vary and must be tested prior to use in the pond. Please contact me if you need more information as we have also looked at dozens of other clarifying agents without much success.

Frost Protection. One of the more-difficult-to-answer questions I get regards hardiness levels of cranberries in February and March. Most growers know that frost protection at 32° from April onward is essential, but how low do you need to protect in February and March? We have been testing frost tolerance of Stevens for 3 years. Several interesting findings were apparent. 1) Uprights from vines grown on peat soil were consistently hardier than those on sand, despite having larger bud size and green leaves in the winter. 2) There was a lot of natural flower death over the winter regardless of temperature. Since there are plenty of flowers to go around, this has no impact on yield, but makes research on the subject more difficult. 3) For any given date, McFarlin was much hardier than Stevens, but for equal stages of development, hardiness is fairly similar. Growers with mixed varieties on the same irrigation system must protect for the most sensitive buds. Growers with just McFarlin, however, should not need to be overly concerned too early in the season. Most beds of any variety will have a few uprights that develop early and have very large buds by mid-February to early March. These buds may be lost without protection; however, one cannot protect an entire bed to save a few advanced buds. 4) Flower buds were much hardier in February and early March than most growers suspected. In February, our data indicated good hardiness into the single digits. Therefore, frost protection in February was not necessary. It was not until mid- to late March that buds began to experience damage in the 20's. I am suggesting, therefore, that growers avoid putting surplus water on their beds in March for frost protection unless really necessary. Excessive water makes herbicide efficacy difficult. 5) I still see a lot of sensors set in the wrong locations in the bed. Remember that an exposed sensor at the level of buds in the lowest location within the beds is the best indicator of what the actual bud temperature is. Sensors within protected shelters, on or near a bank, or elevated a foot above the vines, can be several degrees above bud temperature and usually have a lag time before they reach a minimal temperature. That is, they may eventually reach 32° but 2-3 hours after the buds have reached a similar minimum.

IPM. Integrated pest management is a great tool for controlling pests on our farms. The trouble is that most of us don't even come close to using it to its fullest potential. To help determine what is limiting the success of implementation of IPM by all growers, we will be contacting many of you in person to ask survey questions. My goal is to determine how to improve IPM implementation by all growers.

MISCELLANEOUS

Water Rights. Who needs a water right? A water right is necessary if you plan to divert any amount of

water for any use from: surface waters (water located above ground)--these include lakes, rivers, streams, and springs; and ground waters--if you plan to withdraw more than 5,000 gallons per day or if you plan to irrigate more than .5 acres of lawn or non-commercial garden.

The state water codes are based on a "first in time, first in right" premise. This means that any new water right is subject to existing rights. Therefore, your application may be denied, or your water use may be regulated or modified if it adversely affects existing rights. This will also protect your water right against impairment by future applicants.

For more information about water rights and the application process, contact the DOE - Southwest Regional Office, PO Box 47775, Olympia WA 98504-7775, phone: 360-407-6300, TDD: 360-407-6306

Safety Tip. Mark Purschwitz, Ag Safety Specialist at the University of Wisconsin forwarded the following message. NEVER FILL A GAS CAN IN THE BED OF A TRUCK WITH A BED LINER IN IT. PLACE THE CONTAINER ON THE GROUND, AWAY FROM VEHICLES AND PEOPLE, TO FILL IT. Apparently, the plastic bed liner prevents the static charge generated by gasoline flowing into a metal container from grounding. As the charge builds, it can create a static spark between the can and the gas nozzle, igniting the gasoline and causing a fire or explosion. Apparently there are two technical bulletins out on this--one from Ford Motor Corp. and one from Standard Oil. Chevron also has issued an alert in their marketing bulletin 36-1904.

Cranberries on the Worldwide Web. One of the best ways to communicate with today's technology is through the use of the worldwide web and e-mail. E-mail allows instant communication for a very small price. It is indispensable for me. I would love to expand the network of cranberry growers using e-mail; however, I am afraid this is a very small proportion of growers. In order to evaluate how small that user group is, I would appreciate it if any grower with e-mail would mail me at pattenk@coopext.cahe.wsu.edu. I suspect that I will get insufficient response to warrant e-mail as a means of providing grower information.

Matthew Stullick Cancer Fund. Matthew, the 2 year old son of Mike and Connie Stullick is suffering from bone cancer. I hope that many of you will be able to contribute to this very worthy cause. Please make checks out to "The Matthew Stullick Cancer Fund" and send them to Charlene Savidge, Ocean Spray, Inc. 1480 State Route 105, Aberdeen WA 98520-9505. The Stullick family will need our thoughts, care, and prayers.

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COOPERATIVE EXTENSION
Washington State University
Long Beach Research and Extension Unit

Dr. Kim Patten
Associate Horticulturist
e-mail: pattenk@coopext.cahe.wsu.edu
phone: 360-642-2031
FAX: 360-642-2031