



Cranberry Station Newsletter

APRIL 2008

UMASS CRANBERRY STATION

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YELLOW VINES SHOWING UP THIS SPRING

Last July we had several reports of yellow vine (YV). At that time growers reported symptoms consisting of yellowing along the leaf margins (edges) with the areas along the leaf veins remaining green and older leaves affected first.

This spring, we have had reports of off-color vines, especially on Stevens. On examination, it appears that what we are seeing is the residual YV from last summer becoming visible as the leaves lose their dormant color.

What causes YV? YV symptoms are most likely due to nutritional imbalances in the cranberry plants. BUT fertilizer management is not the cause of the problem. Instead, we believe that the nutrient imbalance is secondary to root problems caused by stress. The stress involved is most often water stress (too much OR too little) but may also involve herbicide stress on some bogs. These stress conditions lead to poor root development. Last spring many bogs stayed wet due to late ice out and frost protection. This can lead to shallow rooting. Casoron use can aggravate the problem.

We have previously visited bogs with patches of YV and have found that the soil water content in the YV areas is either much higher or much lower than that in the surrounding green areas. The consistent finding has been that the rooting depth in YV areas is shallower than that in unaffected areas. In drought conditions, common most years during July and August, uneven distribution of water occurs due to reliance on sprinkler irrigation and varying distance to the underlying water table. Put this together with the high nutrient demand during early fruit development and nutritional problems may be the result. Fertilizer tends to be washed away from the roots during irrigation and areas with poor rooting may not be able to move enough minerals and water to meet the demands of both shoots and fruit. This sets up a competition for resources in which the developing fruit and the youngest leaves (at the top of the shoot) are the best competitors, leaving the older leaves showing symptoms of nutrient stress, in this case, YV.

Treating YV — what to do this spring. Applications of Sul-Po-Mag (100 lb/acre) or Epsom Salts (Magnesium sulfate - 25 lb/acre) can aid in vine recovery where residual yellowing is apparent — apply as soil warms to ~50°F (usually early May). However, the important thing is to address the cause of YV.

Improve bed drainage!! This is key to correcting the rooting depth problems that cause YV. In most cases, YV appears in areas that were too wet early in the season. This leads to limited root development and these same areas are then the most susceptible to YV and water stress later in the season. Rooting depth can be improved by keeping the bed well drained early in the season. This is particularly important in years with frequent frost nights requiring sprinkler operation or in years with heavy rainfall. When the water table is closer than about 6 inches below the surface, root development and root function is impaired.

CAROLYN DEMORANVILLE

LORSBAN 75WG IS NOT A RESTRICTED USE PRODUCT!!

Lorsban 75WG is not a federally restricted use pesticide. The novel formulation is a water dispersible granule that gives it lower mammalian risk and improved crop safety. It has better residual efficacy, lower odor, significantly reduced dust, and is more rainfast than the 4E and 50W formulations. Gowan markets this formulation and it is the only non-restricted Lorsban available. The UMass Chart Book and At A Glance mistakenly lists Lorsban 75WG as a restricted use product.

MARTY SYLVIA

Dr. Carolyn DeMoranville
Station Director

GROWING CALIBRACHOA AND GERANIUM IN CRANBERRY POMACE MIXES

Cranberry pomace compost (or “cranpost” as one grower calls it) is a waste material of the cranberry processing industry in Massachusetts and as such it poses a disposal problem. At the same time its appearance and physical characteristics suggest that an opportunity exists to use it as a growth medium amendment in the greenhouse industry.

The use of organic waste materials and composts as amendments to greenhouse potting mixes has been studied and practiced for many years. Today, many organic waste and compost mixes are being produced from “cleaner” or “less offensive” materials like farm manure and other agricultural wastes, paper, leaves and other landscape wastes, and food processing by products. For municipalities, industries, and farms and other agricultural operations, composting is becoming an important means of waste disposal because of the rapid increase in disposal costs and the shrinking number of acceptable disposal alternatives.

Growing mixes containing organic wastes and composted materials are used with great success in the greenhouse industry, but sometimes problems occur which are serious enough to reduce plant growth and quality. These problems are often related to several factors: the use of the compost alone as a growing mix without blending with other materials, poor drainage and too much weight, excess soluble salts or ammonium-nitrogen, nutrient deficiencies resulting from waiting too long after planting to start applying fertilizer, or toxicity of an especially abundant nutrient.

Trials utilizing cranberry pomace have been conducted for several years by Paul Lopes with commercial growers in Massachusetts. Growers have produced crops such as hardy mums, poinsettias, flowering hanging baskets and mix containers of flowering annuals. These trials have shown promise in utilizing cranberry pomace as a component in soil media and have familiarized the growers with the use of cranberry pomace. This project was conducted to study plant growth response to cranberry pomace mixes more carefully under controlled conditions. It is part of a larger project supported by a grant from The New England Greenhouse Conference.

How the plants were grown

Calibrachoa. Cuttings of ‘Million Bells Pink’ were taken and stuck in 72-cell plug trays of Fafard 3B soilless growth medium on January 25, 2007. Before sticking, the cuttings were dusted with Roo tone rooting powder. The cuttings were placed under intermittent mist to root. Rooted cuttings were transplanted to 4-inch pots of Fafard 3B (control) or to various formulations of cranberry pomace growth media on March 1.

Two types of cranberry pomace were tested. One consisted of pomace that had been composted for about 3 years (we call it “old”) and had the appearance and consistency something like coffee grounds. The initial pH and EC of this material was 5.5 and 0.57 mmho/cm, respectively. The second type of pomace was about 6 months old (“new” pomace) and was not probably completely composted as seeds and recognizable fruit skins were obvious. The initial pH and EC of this material was 5.8 and 0.88 mmho/cm, respectively.

Different growth media were formulated using the “old” and “new” types of cranberry pomace: 100% pomace, 50% pomace + 50% sphagnum peat moss, and 50% pomace + 50% Fafard 3B (volume basis). There were 8 single-plant replicates per pomace growth medium and the control. The only fertilizer amendment added to the media was dolomitic limestone at a level of 5 lb./yd³. Plants were fertilized with 180 ppm N from Technigro 17-5-24 alternating with 15-0-15.

On April 5 plant height and diameter were measured and the tops were harvested for dry weight determination. After harvest the growth media were sampled for pH and EC measurements. EC was determined using the 2:1 method.

Seed geranium. Seeds of ‘Ringo 2000’ were sown in 144-cell plug trays of Metro Mix 250 on March 2, 2007. Seedlings were transplanted to 4-inch pots of Fafard 3B (control) and the various formulations of cranberry pomace growth media described for *calibrachoa* on April 9. There were 8 single-plant replicates per pomace growth medium and the control. Plants were fertilized with 180 ppm N from Technigro 17-5-24 alternating with 15-0-15.

Days to flower from time of seed sowing were recorded when the first floret of the first flower cluster

opened. On June 3 plant height, plant diameter, and length of the first flower stalk were measured and the tops were harvested for dry weight determination. After harvest the growth media were sampled for pH and EC measurements.

Results

Calibrachoa. Plants grown in the various cranberry pomace media were indistinguishable from the Fafard 3B control in terms of foliage color and flowering (Figure 1), height, and diameter (Table 1). In one treatment (“100% new”) plant diameter was significantly less than the control and in three cases shoot dry weight was also less than the control. However these differences were too small to be of practical importance. No growth medium formulation tested, including Fafard 3B, resulted in clearly better plants than another.

Figure 1. Calibrachoa grown in (L to R) Fafard 3B, 100% old pomace, and 100% new pomace.



No differences between the roots of plants grown in pomace media and the control were apparent upon visual inspection of root structure and development (Figure 2).

The pH and EC of pomace media was lower or not different and higher or not different, respectively, than the pH and EC of Fafard 3B control (Table 2). In general all media were acidic and of moderate EC at the end of the experiment.

Table 1. Growth of *calibrachoa* ‘Million Bells Pink’ in cranberry pomace growth media.

<u>Growth medium</u>	<u>Plant height (cm)</u>	<u>Plant diameter (cm)</u>	<u>Shoot dry weight (gm)</u>
Fafard 3B (control)	19.8 ^z	40.7	7.8
Old 100%	8.7	38.9	7.2
Old + 50% peat	20.0	40.7	7.7
Old + 50% 3B	17.8	39.1	<u>6.6</u>
New 100%	17.9	<u>36.4</u>	<u>6.4</u>
New + 50% peat	19.9	37.6	6.9
New + 50% 3B	20.6	37.8	<u>6.8</u>

^zUnderlined means are statistically different from Fafard 3B (control) at P=0.05. (1 inch = 2.54 cm).



Figure 2. Root systems of *calibrachoa* grown in (L to R) Fafard 3B, 100% old pomace, and 100% new pomace.

Table 2. pH and EC of cranberry pomace growth media.

<u>Growth medium</u>	<u>pH</u>	<u>EC</u>
Fafard 3B (control)	5.4 ^z	2.15
Old 100%	<u>4.8</u>	<u>1.70</u>
Old + 50% peat	<u>4.9</u>	<u>1.67</u>
Old + 50% 3B	<u>5.2</u>	<u>1.54</u>
New 100%	5.5	2.21
New + 50% peat	<u>5.0</u>	<u>1.75</u>
New + 50% 3B	5.2	<u>1.95</u>

^zUnderlined means are statistically different from Fafard 3B (control) at P=0.05.

Seed geranium. All cranberry pomace treatments produced geranium plants of acceptable growth and quality (Figure 3), however plants growing in the three media formulated with “old” pomace were significantly smaller in diameter and had less dry weight than the Fafard 3B control (Table 3). Plants in the “100% old” treatment were also shorter than the control. In media containing “new” pomace geranium growth was not different from the control.

Flower stalk length and days to flower were not affected by pomace compared to the control. The root systems of plants growing in media containing “old” pomace appeared to be healthy, but were not as extensively developed as the roots of the control or with “new” pomace (Figure 4). This was especially true in the “100% old” pomace treatment. In this case the root system could be easily pulled from the medium and it did not seem to adhere or be attached in any way to the organic materials.

Growth medium pH and EC measurements at the end of the experiment do not explain the poor root growth in the “old” pomace treatments because it was similar to the control and “new” treatments: moderately acid pH (a little low for geraniums) and low to moderate EC. In

a commercial greenhouse we have observed similar abnormal root growth by poinsettia in the same media, but as yet we don't have a conclusive explanation for it.



Figure 3. Seed geranium grown with (L to R) Fafard 3B, 100% old pomace, and 100% new pomace.



Figure 4: Root growth in 100% old pomace (left) vs. 100% new pomace (right)

Table 4. pH and EC of cranberry pomace growth media.

Growth medium	Growth medium	Growth
	pH	EC
Fafard 3B (control)	5.9 ^z	0.88
Old 100%	6.0	0.81
Old + 50% peat	5.8	1.00
Old + 50% 3B	<u>5.6</u>	0.77
New 100%	5.8	0.95
New + 50% peat	5.7	1.06
New + 50% 3B	<u>5.6</u>	1.07

^zUnderlined means are statistically different from Fafard 3B (control) at P=0.05.

Conclusion

Our work with cranberry pomace media so far suggests that it has good potential as an alternative growth medium component. If we only tested *calibrachoa* we'd probably conclude that pomace has no problems and it's "good-to-go" for use by growers. However, results with seed geranium demonstrate why we plan to grow other species of crops in pomace media beginning this fall with poinsettia and to continue commercial field trials. Right now the only explanation for the different response of *calibrachoa* and geranium to "old" pomace may be that the *calibrachoa* cuttings had a much larger and more extensive root system at potting than did the seed geranium which was started in a much smaller-sized plug cell.

Table 3. Growth of seed geranium 'Ringo 2000 Red' in cranberry pomace growth media.

Growth medium	Plant height (cm)	Plant diameter (cm)	Flower stalk length (cm)	Days to flower from sowing	Shoot dry weight (gm)
Fafard 3B (control)	27.8 ^z	32.2	23.9	87	18.8
Old 100%	<u>21.4</u>	<u>26.6</u>	22.1	88	<u>13.9</u>
Old + 50% peat	25.0	<u>29.0</u>	21.8	86	<u>15.8</u>
Old + 50% 3B	27.2	<u>29.4</u>	23.3	87	<u>16.8</u>
New 100%	25.6	30.3	23.5	<u>84</u>	<u>16.9</u>
New + 50% peat	25.1	30.4	21.4	87	<u>17.7</u>
New + 50% 3B	26.3	30.1	22.1	86	<u>17.3</u>

^zUnderlined means are statistically different from Fafard 3B (control) at P=0.05. (1 inch = 2.54 cm).

Salvia Grows Well in Cranberry Pomace Mixes

Successful commercial trials with cranberry pomace as a growth medium amendment have been conducted in Massachusetts for several years by Paul Lopes. Growers have produced crops such as hardy mums, poinsettias, flowering hanging baskets and mix containers of flowering annuals. These trials have shown the promise of using cranberry pomace as a component in growing media and have familiarized growers with its use. Projects at UMass studying plant growth response to pomace mixes under controlled conditions have also shown positive results (Cox and Lopes, 2007). This is a brief report of work looking at the response of salvia to cranberry pomace growing media. It's part of a larger project supported by a grant from The New England Greenhouse Conference.

How the plants were grown

Two types of cranberry pomace were tested. One type consisted of pomace composted for about 3 years ("old") resulting in an appearance and consistency something like coffee grounds. The initial pH and EC of this material was 5.5 and 0.57 mmho/cm, respectively. The second type of pomace was about 6 months old ("new") and was not completely composted as seeds and fruit skins could be seen. The initial pH and EC of this was 5.8 and 0.88 mmho/cm, respectively.

Plugs of 'Empire II Mix' salvia were obtained from a commercial propagator and transplanted to 4-inch pots of Fafard 3B (control) and pomace growth media on 2 October 2007. Plants were fertilized at every watering with 180 ppm N from Technigro 17-5-24 alternating with 15-0-15.

Pomace growth media formulated with "old" and "new" pomace at 25, 50, 75, and 100% were mixed with sphagnum peat moss on a volume basis. Dolomitic limestone at 5 lb./yd³ was added to the pomace media. There were 8 single-plant replicates per treatment and the control. On 22 December foliar height (height measured to the top of the foliage) and total plant height (measured to the top of the flower stalk) were measured and the tops were harvested for dry weight determination.

Results

Data analysis revealed no significant differences in foliar height, total height or dry weight between treatments (Table 1). Growing salvia in old or new cranberry pomace resulted in plants no different from the Fafard 3B control regardless of pomace level. There were no differences in appearance between pomace treatments and the control plants. Looking at the data, it might seem that there were some differences between treatments (e.g., height of 25% old pomace vs. control), but these differences were due to variability between plants in the treatments. The existence of this variability might have been due to the fact that the plants were from a seed mix.

Results of this study with salvia were very similar to earlier experiments with *calibrachoa* and geranium (Cox and Lopes, 2007) and grower trials with other crops across Massachusetts. In general, cranberry pomace is an acceptable amendment for greenhouse growing media.

Reference

Cox, D. A. and P. Lopes. 2007. Cranberry pomace as a growth medium for greenhouse crops. *Floral Notes*. 19(6):6-9.

Douglas Cox
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Table 1. Growth of salvia in cranberry pomace-amended media.

Growth medium	Foliar height (cm)	Flower height (cm)	Dry weight (gm)	Foliar height (cm)	Flower height (cm)	Dry weight (gm)
Fafard Mix 3B (no pomace)	17.1	25.0	6.7			
		Old pomace			New pomace	
100% pomace	15.3	20.9	6.7	16.3	23.4	6.8
75%	16.2	22.8	6.2	14.7	23.0	6.4
50%	16.6	23.2	6.2	17.5	24.5	7.8
25%	14.9	21.1	6.5	17.9	23.5	6.5

**PRELIMINARY KEEPING
QUALITY FORECAST**

As of April 1, there are 3 points out of a possible 10 that favor keeping quality for the 2008 Massachusetts cranberry crop. The 3 points were awarded for favorable sunshine hours in February (1 point) and March (2 points). The forecast is for **FAIR** keeping quality. The final keeping quality forecast (issued after June 1) could be upgraded if we have a cool and dry April and May. Based on the present forecast, fungicide applications and the rate of fungicides applied should not be reduced.

As for the holding of late water, there are no definitive indicators pro or con. Growers should determine whether to hold late water based on bed condition: was the bed sanded, does the bed show visible winter injury or other stresses (we did experience a drought last summer and there is a reasonable amount of yellow vine syndrome showing up at this point) and was fruit rot incidence high in 2007? There was very little sanding done this winter and there should be minimal winter injury to vines. Check the section on late water in the Chart Book for advice regarding whether to use this cultural practice. If you have any questions, please contact me.

Frank Caruso, Plant Pathology

HERBICIDE UPDATES

Kerb Update

We still have not heard about our petition to be able to use Kerb under an emergence exemption for 2008. I hope to receive confirmation soon. Please check the home page of our web site for current updates. Most Kerb applications are not made until early-mid May, so we still have some time.

Callisto Update

We are planning a workshop for early June to distribute more information about using Callisto. The enclosed fact sheet will be posted on the web site. PDFs of the supplemental label, the full label, and the MSDS for Callisto are currently available on the home page of our web site. Stay tuned for more information!

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