

# MASSACHUSETTS BERRY NOTES

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## Volume 13-- 2001

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### Message from the Editor

**Sturbridge Meeting Coming Up:** The New England Vegetable and Berry Conference is coming up Dec. 11 – 13, 2001. If you haven't registered yet, do so soon. If you need a brochure with the program and registration information, please give me a call at 413-545-4347. There's a great small fruit program this year. Don't miss it!

### Strawberries

#### Cold Acclimation in Strawberries: How Strawberries Get Ready For Winter

*Adapted by Pam Fisher from a presentation by Dr. Rebecca Darnell, OBGA Conference, 1996*

The process of developing tolerance to cold temperatures is called acclimation. Cold acclimation in strawberries begins when days get shorter in late summer. Short days alone will trigger strawberries to develop tolerance to -2°C or -3°C. For further acclimation, plants must be subjected to cold temperatures, i.e. days of about 10°C and nights around 0°C. Photosynthesis is also required for cold acclimation to occur, so plants which are mulched before these conditions have met will not be as winter-hardy.

Even when fully acclimated, or "hardened-off for winter", strawberry plants are not as tolerant of cold temperatures as other perennial fruit crops. Cold injury to crowns appears as browning of crown tissue. Crowns will be killed at temperatures of -12°C to -14°C in the crown, but even tissue temperatures of -

6°C can lead to reduced leaf number, leaf distortion, and fewer flowers and fruit.

The extent of cold-temperature injury in strawberries is determined by many factors. These include the extent of cold acclimation, the cultivar, the part of the plant affected, the rate and duration of freezing, and cultural practices. Rapid freezes, when tissue temperatures drop 2-3 degrees per hour, are fatal. Although the duration of freeze also affects how much injury occurs, most injury occurs in the first 24 hours of damaging temperatures. Freeze/thaw freeze cycles will also cause more injury than consistently cold temperatures, if the thaw lasted more than 2-3 days.

Nutrient and water status of strawberry plants also affects cold acclimation. Excess or deficient nitrogen will inhibit acclimation. Optimum levels of phosphorous promote acclimation. Plants acclimated under dry conditions fare better than plants which are not water-stressed. Mulching is important to prevent cold-temperature injury. Raised beds can be 4-6°C colder than flat beds, but mulching overcomes most of this negative effect.

(Source: *The All Ontario Berry Grower, Volume #0.10 - October/2001*)

## Winter Mulch for Strawberries

*Patrick Byers, University of Missouri*

Fall is here, and an important fall job in a strawberry planting is mulching. While commercial strawberry production extends into colder climates, such as the northern US and Canada, the strawberry plant is actually vulnerable to cold injury at relatively warm temperatures. The key to consistent production in cold climates, such as Missouri, is mulching. Research in Ohio and elsewhere has shown that the crowns of non-mulched strawberry plants can suffer damage after winter temperatures below 12°F. Unprotected strawberry plants are also vulnerable to desiccation damage from drying winter winds. The disease black root rot is more severe in nonmulched plantings.

Winter mulch offers several benefits for a strawberry planting. The mulch protects plants from severe cold. Desiccation is a problem, especially after winter temperature fluctuations, and mulch will protect plants from drying out. Mulches will also protect plants from injury caused by soil heaving, which results from freezing/thawing cycles during the winter.

When should the strawberry grower plan to apply mulch? Research from Illinois suggests that a good guide is to apply mulch after three consecutive days with a soil temperature of 40°F. This soil temperature usually occurs after several frosts, and the plants have slowed growth in response to cooler temperatures. Apply mulches before the soil freezes. In Missouri, mulches are usually applied in late November.

Production systems for strawberries in Missouri are undergoing changes that affect mulching. Plants on raised beds, for example, are more vulnerable to cold injury than plants in level plantings. Annual production systems, such as fall planted plasticulture, may utilize less hardy or disease susceptible cultivars. As we will see, mulching practices must adapt to these new systems.

The traditional mulching material for strawberries in Missouri is straw. Straws from wheat, rice, oats, or Sudan grass work well. Straws coarser than Sudan grass are not recommended. A good straw source will deliver straw that is clean, free from weed seed, and contains a minimum of grain seed. Strawberry growers can produce their own mulch, often cutting the straw before the grain

seed is viable. Store straw for mulching in a dry area. Occasionally grain seedlings can become a weed problem the following spring; an application of sethoxydim will give good control.

A traditional level matted row planting will require 2.5-3 tons of straw per acre for a 2-3 inch deep mulch. This equates to about 300 small bales of average weight. Raised bed plantings may require twice this amount for adequate coverage. Smaller plantings may be mulched by hand. Larger plantings often use bale choppers to break up the straw bales and distribute the straw over the bed. Choppers are available for both small bales and large round bales. Plasticulture plantings of cultivars such as Chandler are usually not mulched with straw.

A recent development of great interest to strawberry producers concerns floating row covers. These covers are composed of a plastic such as polypropylene, spun bonded into a fabric that is permeable to light, air, and water. Research and growers' experiences demonstrate that these covers are useful for winter protection of strawberry plantings. While floating rowcovers are available in several weights, only the heavier weights are recommended for winter protection. At present a widely available weight recommended for winter strawberry protection is 1.25 oz/yd<sup>2</sup> (42 g/m<sup>2</sup>). A variety of fabric widths are available, with common widths ranging from 15 feet to 60 feet. At present this material costs about 4 cents per square foot. With proper care, this heavier fabric should last 3-4 seasons. Floating row covers are widely used to protect annual plasticulture plantings.

Row covers are best applied on still days. Be sure to line up sufficient labor to place the row cover. If possible, use wider widths for more efficient application. The row cover edges must be anchored, as must areas where two covers overlap. A variety of methods are used to anchor the edges. Edges may be anchored with posts, rocks, or tube sand. The edges may also be covered with soil.

Once the mulch is in place, the job is not done for the winter. Monitor the planting frequently. If straw has blown off areas, replace at once. Watch the edges of row covers, and adjust anchors if needed. Repair any rips or holes as soon as possible. (Source: *The Berry Basket, Vol. 4, No. 3, Fall 2001*)

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## Raspberries

### Primocane-fruited Raspberries Continue to Fruit Without Chilling in Greenhouses

*Adam Dale, University of Guelph*

Recently, my research team has completed a major commitment to investigate the feasibility of growing raspberries year-round in the greenhouse. Our economic estimates suggest that this could be profitable in Ontario. We thought that primocane-fruiting varieties offered considerable potential as we would be able to fruit them for long periods of time without moving the plants in and out of the greenhouse at regular intervals, and we would be able to grow them in the greenhouse from start to finish. Raspberries normally need a cool period in winter to break dormancy and fruit, but we did not know how long we could keep primocane-fruiting raspberries bearing before we needed to give them a cool period. In one set of experiments we looked at the performance of a group of primocane-fruiting (fall-bearing) raspberries over a three-year period with and without a cold period.

We used seven primocane-fruiting varieties: Anne, Autumn Bliss, Autumn Britten, Caroline, Heritage, Polana, and Summit. Plants were potted in 1 gal growbags in a commercial mixture of peat, vermiculite, perlite, dolomitic limestone, and bentonite clay. After the first growing season, Autumn Bliss was discarded because the fruit was crumbly. Plants were grown above 6°C at night and 20°C during the day, trickle irrigated twice daily and fertilized regularly with slow-release fertilizer. The flowers were pollinated by bumble bees and spider mites and thrips controlled with predators.

In the spring of 1997, between 30 and 54 plants of each variety were placed in a randomized complete block design of six replicates in the greenhouse and fruited until December when all the canes were removed and the pots divided into two sets. All but one plant per replicate of each variety were placed in a cooler. The plants remaining were left in the greenhouse and fruited until December 1999 (no cold period for three years). The plants in the cooler were moved outside on 8 May 1998 and brought in to the greenhouse on 19 August 1998 and

fruited until December 1999 (no cold period for two years).

Over the three-year period, the plants that were given a cold period in the winter of 1998 produced fruit in all three years. Polana was the highest yielding variety and Autumn Britten had the largest fruits (Table 1). In the first year, Autumn Britten was the earliest fruiting variety, after the cold period in the second year, Autumn Britten and Polana were the earliest, and in the third year, without a cold period, Polana fruited the earliest (Table 1).

The fruiting patterns of the varieties differed considerably. Autumn Britten showed a much more continuous fruiting pattern. In the plants that had been given a cold period, all varieties produced a fall peak in 1998 and summer and fall peaks in 1999. However, Autumn Britten produced at least two fruits per plant for 68% of the time compared to 39% of the time in Heritage. Where the plants were not given a cold period for three years, both Polana and Autumn Britten produced a summer and a fall peak in both years, but Autumn Britten produced a third peak in the winter of 1999.

For greenhouse production of primocane-fruiting varieties we consider that earliness is the most important characteristic because it increases the harvesting period. This is crucial due to the high energy and capital costs. We consider that only Autumn Britten and Polana are suitable for greenhouse production because of their earliness.

Although primocane-fruiting raspberries can be successfully fruited without a cold period, the varieties used here produced little fruit during the winter period. Therefore, we feel that with the present varieties, it is not cost effective to fruit continually without a cold period as fruit production is low during the period when both energy cost and raspberry prices are high. However, we feel that primocane-fruiting varieties can be bred which have low cold requirements so that they will fruit for February onwards. (*Source: The All Ontario Berry Grower, Volume #0.11 - November/2001*)

**Table 1.** Yield, mean berry weight and days to 5% harvest in six Primocane-fruiting raspberry varieties in 1997-1999

	Average Marketable Yield g/cane/year	Average Berry Weight g/Berry	Relative Days to % Harvest		
			1997	1998	1999
Polana	641	2.4	26 Aug	29 Aug	13 May
Summit	516	2.2	25 Aug	16 Sep	14 Jun
Autumn Britten	447	3.4	9 Aug	2 Sep	5 Jun
Anne	443	3.3	26 Aug	19 Sep	12 Jul
Caroline	419	2.5	24 Aug	19 Sep	12 Jul
Heritage	372	2.2	8 Sep	22 Sep	1 Aug

## Highbush Blueberries

### Reviewing the Basics

*Ben Fuqua, University of Missouri*

New and potential growers of highbush blueberries in Missouri need to become acquainted with the “Basics” of blueberry culture before starting a planting. Blueberries are unique plants that require rather specific soil conditions for best growth and production. Being aware of these requirements and making appropriate adjustments prior to setting plants in the ground can often save time, money, and many headaches.

**Marketing Strategies:** A marketing plan should be the first step for anyone considering a commercial blueberry planting. A sound, well-planned marketing scheme is often the difference between success and failure of a blueberry operation. Nothing is more frustrating than seeing blueberry bushes loaded with ripe, high quality berries and having no buyers. A good marketing plan incorporates several factors including:

- the number of potential customers within a 25-30 mile radius of your planting,
- the number and acreage of other blueberry growers in the same general area,
- the type of market preferred (i.e. UPick, on-farm markets, farmer’s markets),
- the availability of labor (especially during harvest),
- facilities (cold storage, weighing and selling areas, parking),
- advertising outlets, and the location of the market in relation to the consumer.

Adding “value-added” goods expands the marketing plan by offering processed blueberry products throughout the year.

**2. Site/soil selection:** Selecting a good site for blueberry plants is one of the most important decisions a grower has to make. The large capital investment at the time of establishment and the fact that blueberry plants produce fruit for many years makes site selection and site preparation crucial decisions.

An “ideal” site for highbush blueberries will have a well-drained, low pH soil that has a high organic matter content. The site should be exposed to full sunlight, have good air circulation, and have access to water for irrigation. The planting site should also be conveniently located in respect to other buildings or facilities of the blueberry operation.

**3. Site preparation:** Site preparation should start one to two years before planting, as most sites require some slight modification(s) to prepare the soil for growing blueberries. Perennial weeds, such as Johnsongrass and Bermuda grass should be completely eradicated from the site by chemical and/or mechanical means. Soil samples should be taken to determine the soil pH and other nutrient levels. Soil organic matter content can be increased by incorporating residues from cover crops, such as sudan, millet, rye, or wheat into the proposed plant rows.

Forming berms or raised beds for the plant rows will improve drainage around the plants. Sulfur, fertilizers, and other amendments needed to correct pH or nutrient deficiencies in the soil should be done at least 6 months prior to plant establishment.

**4. Variety/plant selection:** Growers should select blueberry varieties that are adapted to Missouri climates and meet the objectives of their marketing plan. Most growers in Missouri prefer early-season and mid-season varieties that ripen from early June to mid-July. Growers wanting to extend the blueberry season can add a late-maturing variety that produces ripe fruit from mid-July to mid-August. All plants should be purchased from reputable, certified nurseries. Two-year old potted or bare rooted plants normally have an extensive enough root system to survive being transplanted directly to the field. Buying older, larger plants cannot generally be justified because of the higher costs for plants, transportation, and planting.

One-year rooted cuttings cost less than the older plants, but should not be planted directly in the field. Rooted cuttings need to be grown in pots for an additional year to develop a larger root system before being planted.

**5. Planting:** Transplanting the blueberry plants to the field can be done in either fall or spring. The planting hole (or trench) should be large enough to hold approximately one gallon of wet peat moss in addition to the mass of plant roots. Soil around individual plants should be compacted slightly to insure good root to soil contact and eliminate air pockets. Blueberry plants need to be mulched with sawdust or similar materials as soon as possible after planting. An irrigation system must also be installed at or shortly after planting to provide supplemental water as needed.

**6. Requirements after establishment:** Several other operational procedures must be done each year to maintain healthy, highly productive blueberry plants. Mulches must be replenished every one to two years in order to maintain a 4- to 6-inch depth of mulch around the plants. Irrigation pumps, filters, and lines require regular maintenance and repair in order to supply supplemental water to plants during the growing season. Weed control is a year-round challenge. While mulches help reduce weed problems, chemical and/or mechanical control methods are needed almost every year. Annual pruning of blueberry bushes during late winter/early spring is necessary to sustain healthy, vigorous plants capable of producing high yields of large-sized berries. Blueberry plants will also need fertilizing, via organic or chemical fertilizers, periodically throughout the growing season.

**Summary:** Highbush blueberry plants have proven to be a profitable and fun crop for Missouri growers. Growers have done an excellent job of producing high yields of quality berries. Growers have also done an outstanding job of selling “Missouri-grown blueberries” to the public as evidenced by the high demand for fresh and processed blueberries. The basic information on growing blueberries in Missouri has evolved over the 25 years of blueberry production within the state. Both Missouri blueberry growers and researchers have

contributed to developing these guidelines. Thus, all growers, even the experienced ones, should occasionally

review the "basics" for growing blueberries in Missouri. (Source: The Berry Basket, Vol. 4, No. 3, Fall 2001)

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## Grapes

### Drought and potassium deficiency: Brothers in Arms

*Hans Walter-Peterson, Cornell University*

As I've been riding harvesters and walking fields with growers this past month or so, I have noticed some symptoms of potassium deficiency, which can often be associated with drought conditions and water stress in vines. While potassium deficiency symptoms can resemble those of other problems, there are a few things that you can look for to decide whether or not the symptoms are due to a lack of potassium.

First of all, symptoms of potassium deficiency will first develop in the basal leaves of a shoot. This is because the vine will mobilize potassium stored in the older leaves in order to provide the growing shoot tip with enough to continue its growth. This fact is useful when looking at leaf symptoms to decide if they are due to this deficiency or another problem that may affect the entire shoot.

The most common symptom of potassium deficiency is yellowing of the basal or mid-shoot leaves, starting at the edges of the leaves. Under more severe deficiencies, the margins may turn brown as the tissue dies.

Another symptom of potassium deficiency is what's called "black leaf." On the upper surface of the leaf, you will see the development of black or dark purple splotches between the veins on the basal or mid-shoot leaves. In more severe cases, the leaf may be completely dark purple or black except for the veins of the leaf.

Potassium deficiencies may show up in low-rainfall years for a couple of reasons: 1) the lack of water in the soil prevents movement of potassium towards the roots, and 2) root growth is generally reduced under drought conditions, so the vine isn't "reaching out" for those nutrients as effectively. Both of these factors can contribute to potassium problems during dry years. In addition, because vine photosynthesis decreases under drought conditions, there is less "pull" on the water and nutrients from the soil into the plant. The more severe examples of drought and potassium problems I saw were also generally on more gravelly soils, where water-holding capacity is not as high.

If you're noticing these kinds of symptoms out in your vineyards, there are a couple of things to think about be-

fore deciding to add a bunch of potash to your soil to increase the potassium in your vines. Consider what you have seen in such areas in the past. Have you noticed these symptoms in this area before? What kind of soil is in that area (gravel, silt, clay)? With the low rainfall during the season this year, potassium deficiency in the vines does not necessarily mean that your soil is deficient in it as well. Consult any soil and/or petiole samples you may have taken in previous years from areas that look questionable. Have there been potassium issues there before? In other words, think about any deficiency symptoms you see in the context of both the dry weather we had this year and your past experience with the vineyard's potassium needs. If you're seeing these symptoms on a well-drained site for the first time, it may not be necessary to change the amount of potash that you apply.

Unfortunately, the time for taking petiole samples to determine potassium status in your vines is past us (I'll put out the word ahead of time for you to start thinking about taking these samples next year). The best time to take these samples is around 70 days (10 weeks) after bloom, from leaves that are located about midway down the shoot. These leaves are good indicators because, under deficient conditions, they will have sent potassium to the younger leaves and shoot tip and will therefore have lower potassium levels in their tissues.

This situation is an excellent example of why both soil and petiole samples are important in order to get the full story on the nutrient status of your vineyard. Basing fertilization decisions only on petiole samples may result in spending time and money on fertilizer applications that your soil doesn't need (and may lose by leaching). On the other hand, soil samples cannot tell you if the vines are obtaining sufficient nutrients for proper fruit and vegetative development. Both can be important tools for establishing or refining a fertilization system for your vineyards.

If you want to discuss any of these issues in more detail with me, please feel free to contact me at 672-2191, drop me an email at <mailto:hcw5@cornell.edu>hcw5@cornell.edu, or just stop by the lab if you're in the neighborhood. As I've told some folks already, I may not be able to answer a lot of your questions right now, but tracking down the answers to them will help me to learn these things quickly. (Source: *Lake Erie Regional Grape Program Crop Update, October 9, 2001*)

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## Gooseberries

### Stalking England's Antique Gooseberries.....

*Steve McKay, Cornell Cooperative Extension*

As the years have passed, so have memories of the many varieties of gooseberries that were once widely available

to home gardeners and fruit farmers. Most people in the US vaguely remember their grandparents talking about goose-

berry pie, or might remember trying the berries in the garden, and having their mouths puckered by the sourness. The good news is that thanks to the efforts of a handful of English nurserymen, the Royal Horticultural Society, and a few other sites, the germplasm of over 200 of the 1,500 varieties of the past is preserved. Even in England, the once popular fruit is often hard to find commercially, except in a few markets, and then only the hard, sour, culinary type.

Cooperative Extension, and some assistance from fund raising efforts at the Chatham fair (New York) have made it possible for me to research the potential of this fruit and discover some opportunities for our local growers. On July 13, I returned from a week long trip to England and Scotland, which allowed me to attend the International Ribes-Rubus Conference, and to collect samples of about 140 different varieties of gooseberries. The fruit is being used for photographs, a series of showings, and flavor evaluation. The meeting in Scotland allowed me to connect with growers from New Zealand, Spain, Chile, and Great Britain who would like to develop international standards and marketing materials for gooseberries.

So why all the excitement? People are finally realizing how diverse the selection in gooseberries is when one looks at flavor, color, texture, and size of the fruit. Most of the varieties are over 100 years old, and have interesting names and stories associated. Names like 'Dan's Mistake', and 'Lancashire lad', 'High Sheriff', 'Broom-girl', 'Hedgehog', 'Viper', and 'Heart of Oak' let the mind wander. I like to think of the berries as falling into four general color groups, red, yellow, green, and white.

Some are hairy, and some are smooth; some are round, and some are teardrop shaped. Size can be classified as small (pea to kidney bean sized), or large (quarter to small plum sized).

Flavor is the next item of interest; people always ask me if the flavors are distinct. The answer is that most all ripe gooseberries give the same initial sensation in the mouth. There is a burst of sweet as the juice flows out, which is quickly balanced by the sour flavor of the skin. In a moment later, the distinctive aroma of the berry can be sensed. I have noticed two classes of aroma, a heavy, almost fermented fragrance, or a fresh, light fruity fragrance. Within these two fragrance groups, there are distinct differences.

When in Scotland, I set up a display of gooseberries that caught the attention of some major fruit marketers from Chile, New Zealand, Spain, and England. Their attention was drawn to the berries, and after some informal conversation, we agreed that it would be nice to standardize a group of gooseberries for international trade. The idea is that a group of varieties that fall into each of the color and size classes will be defined so that marketers can buy and sell product internationally and know what they are talking about. A major advantage to Hudson Valley (NY) growers is that they will have the financial backing to advertise and create demand for the fruit in the US, thus expanding the market. Fruit will be available yearly for a number of weeks at least twice a year, rather than just a couple of weeks. Chefs can use the large varieties as dessert fruit to eat fresh from baskets, and the small varieties for culinary art and cooking. (*Source: The Ribes Reporter, Vol. 13, Issue 1, August, 2001*)

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## Recipes

### Cassis

*Tommie van de Kamp, Queener Fruit Farms, Scio, Oregon*

2 cups fresh black currants, stemmed  
2-1/3 cups dry white wine  
About 3 cups granulated sugar  
About 1 cup brandy or gin

Lightly crush the currants in a large glass bowl. Stir in the wine, cover and leave in a cool, dark place for 2 days. Blend the black currant mixture in a food processor or blender. Line a large funnel with a double layer of cheesecloth and strain the liquid through it. Measure the strained liquid.

For each 1-1/4 cups liquid, measure 1 cup sugar. Put the liquid and sugar into a saucepan and stir over low heat until the sugar has completely dissolved. Do not boil. Simmer over low heat, stirring, for 45 minutes. Cool, then measure.

For 3 parts black currant liquid, add 1 part brandy or gin. Pour into clean, hot bottles. Seal the bottles and label. Keep in a cool, dark place for 2 to 3 days before using to allow the flavors to develop. Makes about 6 cups.

**Variations:** Cassis is most commonly made with brandy or gin, but vodka can be used instead. A small cinnamon stick and a whole clove can be added to the syrup to give a touch of spice.

### Coulis

*Tommie van de Kamp, Queener Fruit Farms, Scio, Oregon*

*This is a quick black currant coulis for desserts.*

Wash and stem 2 cups berries and combine in saucepan with barely enough water to cover.

Gently cook until fruit begins to break down, 2 to 3 minutes.  
Add granulated sugar to taste, 1/4 cup at a time (I use 1 rounded cup of sugar to 2 cups of black currants).  
Cook a few minutes more until sauce thickens slightly.  
Push through a strainer, smashing berries with a spoon to get all the juices; pour liquid into a clean jar.  
Refrigerated, sauce will keep about 6 weeks.  
(*Source: The Ribes Reporter, Vol. 13, Issue 1, August, 2001*):

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## General

### Problem Weed of the Month: Dandelion

*Leslie Huffman, OMAFRA*

Dandelions are one of the most famous weeds in the Composite family. Their bright yellow flowers and fluffy seedheads are visible across Ontario in lawns, no-till fields, and in all perennial crops, including all berries.

Dandelion is known scientifically as *Taraxacum officinale*. It doesn't have many other common names, but the plant might be confused with chicory or common catsear (or false dandelion). Also, it may be confused with other weeds with yellow composite flowers including colt's foot, yellow devil hawkweed, tansy ragwort, sow-thistles, goat's-beard, fall hawkbit and groundsel.

Dandelion is a perennial weed, but it is spread by seed only. Although it has a strong taproot, this is not a common means of propagation. Dandelions are quite susceptible to cultivation, but broken root pieces sometimes sprout new weeds.

Dandelions flower from May to June, and often have a second blossom when the daylength shortens to less than 12 hours in late summer. It doesn't take long for the seedhead to turn to fluff, and the seeds to blow far distances.

Controlling dandelion in berries is a two-pronged challenge. You need to target two "kinds" of dandelions to control: the new seedling (which is similar to other an-

nual weeds), and the established perennial with the long-lived taproots (which is a major challenge).

If you plant in a field where dandelions have seeded, be ready to cultivate out young seedlings as they emerge. Where available, Dacthal will control new seedlings, but needs to be applied before weeds emerge in the spring, at renovation, near Labour Day and again before mulching. Sinbar used at these 4 timings will also help with new seedlings. The Labour Day timing has been useful to control germinating new seedlings.

Established dandelions need repeat treatments of herbicides, depending on when you apply and how large the weed is. Use 2,4-D Amine in strawberries (avoiding the time of fruit bud initiation) and raspberries (in spring before new shoots have emerged) to control established plants. Dandelions are very susceptible to 2,4-D in the fall, although this timing may not be safe for all crops. For small patches, spot treatments of the high rate of glyphosate can be very effective on established dandelions.

Above all else, prevent dandelions from coming into your fields. Mow established plants down before they flower, especially around field edges. Use appropriate herbicides in grassed parking areas, grassed alleyways or on field edges. (*Source: The All Ontario Berry Grower, Volume #0.11 - November/2001*)

### Winterizing Your Sprayer in the Fall

*Helmut Spieser, OMAFRA*

Your field sprayer is likely finished its duties for this year. Any problems experienced with your sprayer this past season should be fresh in your mind. Now is the time to check your sprayer completely and order replacement parts allowing your dealer adequate time to get the needed items.

Cleaning, checking and winterizing your sprayer in the fall prepares it for storage and has it almost field ready in the spring. Having your sprayer in top working condition now will save you valuable time in the spring.

#### Clean the sprayer inside & out

- Cleaning a sprayer both inside and outside not only gets rid of accumulated dirt and grime but possibly more importantly, removes as much of the chemical residue from the system as possible.
- Clean the inside of your sprayer completely using a good tank cleaner.
- Look for any leaks in the plumbing system as you are circulating the cleaning solution through the sprayer. Be sure to repair any leaks before the sprayer is parked for the winter.

- Remove all filters, screens, nozzles and diaphragm check valves and wash them in the same cleaning solution. A nozzle tip brush will aid in removing any buildup of material on screens.
- Reinstall all the filters, screens, nozzles and diaphragm check valves.
- Use a pressure washer and detergent to thoroughly wash the outside of the whole sprayer. Be sure to get all tank surfaces, the boom, tires and rims as well as the frame and undercarriage.

#### **Lube and Bolt Check**

- Once the sprayer is dry, go over the whole sprayer from one end to the other looking for any signs of structural wear. This might show up as signs of movement of frame members or fatigue cracks.
- Any cracks in the frame components or wheel spindles should be repaired immediately.
- Touchup any areas of bare metal to protect against rust.
- Tighten all loose nuts and bolts on structural members.
- Inspect tires for cuts, embedded foreign objects and general tread condition.
- Torque wheel studs to recommended levels.
- Check wheel bearings for adequate grease; repack with grease if necessary.
- Grease and lubricate the whole sprayer as outlined in the operator's manual.

#### **Plumbing freeze protection**

- All plumbing components are at risk of severe damage caused by water freezing. This is especially criti-

cal for the sprayer pump since it is the most expensive part of the plumbing system. Pumps that are not freeze-protected not only risk frost damage but they can also deteriorate in storage as a result of corrosion.

- A 50/50 mixture of a good quality antifreeze and water will protect against frost damage. This antifreeze mixture in the plumbing system will also prevent oxidation from occurring by not allowing air to contact metal surfaces causing rust.
- Mix up 5 gallons of antifreeze and water and pump it through your sprayer till it comes out the nozzles.
- You can now shut off your sprayer and drain the excess from the tank and the boom lines.
- Label this pail carefully and store it safely so you can use it next year.

#### **Foam markers**

- Completely drain the foam marker tank and the solution lines that go out to the boom ends. Use compressed air to blow out any remaining liquid in the foam marker lines.

#### **Electronics**

- Monitors and rate controller consoles are usually mounted inside a tractor cab. These units should be carefully removed and cleaned of any dirt accumulation. Store these units in a cool dry place preferably under cover. Coil the electronics cable that is attached to the sprayer. Use a soft bristle brush to remove any dirt in the cable connector blocks. Fasten this coiled cable to a structural support of the sprayer to keep it from falling to the ground.

#### **Store your sprayer in a clean dry building.**

*(Source: The All Ontario Berry Grower, Volume #0.11 - November/2001)*

## **Cover Crops**

*John Avery, University of Missouri*

Now is the time of year to start planning and preparing sites for a new fruit crop planting. Growers often expand into former pastureland and may leave the pasture cover for the row middles. This can be a mistake! Most pastures have Kentucky 31 tall fescue as the primary grass in the mix. Tall fescue is a hardy grass that will stand up to heavy traffic but it is extremely competitive. If your plants do poorly in this situation, the problem is probably competition from tall fescue. I recommend that a new site for a fruit crop be plowed and cover cropped for at least one year to kill out the fescue and other weeds which may be present in pastures. If a new site has been in woods then cover cropping for a year or two will give time for old tree roots to die and start to decay.

There are several reasons for plowing and cover cropping a site before putting in the new fruit crop. The first is to kill the existing vegetation on the site. When planting into mature grasses and particularly tall fescue, new

plants can be subject to stresses from the grasses, which will result in slow growth or high mortality losses among the young plants. It is generally better to kill the existing ground cover and reseed between rows after the new plants are in and growing. Even if the intent is to have tall fescue as the between row ground cover it is better to start over with a new seeding. This will give the new fruit plants a good start with a year free from competition.

The second is to reduce weed seeds by encouraging germination when the soil is tilled. By turning and disking the soil a couple of times a year to incorporate the cover crop the weed seed are exposed to conditions which encourage germination. Be careful not to let weeds develop and produce a new seed crop though. This is more of a problem with summer cover crops than with winter cover crops. Be sure to mow and/or disk in the cover crop with the weeds before their new seed crop matures.



The third reason to plow and cover crop is to incorporate biomass from the cover crop and weeds to increase the organic matter in the soil. Organic matter will increase the nutrient holding ability of the soil as well as its water holding capacity. The tilling of the soil is also increased making it easier to work. The cover crop pulls nutrients from deep in the soil and leaves them in the top layer of soil with the organic matter thus making them available to the new fruit crop.

So, what are some of the crops to consider when developing a plan for cover cropping a new planting site? There are two broad categories of crops to select from, the grasses and the broadleaves. The grasses would include the cereal grains; rye, wheat, oats, etc; and the sorghums and their hybrids. The broadleaf crops would include the clovers, buckwheat, and other crops such as sunflower. What are the considerations in a choice of a cover crop? You want something that will produce a high biomass, something that is fast growing, and is an annual or biennial, or if perennial will not become a weed itself in your fruit planting. Stay away from plants like white clover or perennial grass because they can become a weed if they are in the row with the fruit plant.

Another thing to consider is that there are two seasons in which to consider cover crops, the fall planting season and the spring season. In the next few paragraphs I will discuss various cover crops to use and their benefits and drawbacks.

**Winter cover crops:** The cereal grains are a good choice for cover cropping a new site. They have a relatively long window in which they can be planted and are easy to find. In southwest Missouri rye is one of the easiest crops to find because of its use as forage for livestock. But wheat and oats are equally abundant. They are relatively inexpensive unless you go with some of the forage rye cultivars.

If you have trouble finding seed of wheat or rye, you can use un-milled feed oats but be warned some of these are spring oats and will winter kill. Spring oats, however, will grow late into the winter and only severe cold will kill it. The cereal grains should be allowed to grow until early spring and then should be mowed and disked into the soil at the early tiller stage (when the seed heads first appear) of growth. If allowed to mature the seed will germinate during the summer and can be a problem when the fruit crop is planted after the cover crop.

The cereal grains can be planted from September to the end of October and in some years can be planted as late as the middle of November. The main requirement is adequate soil moisture at or close to planting. If soil moisture is lacking due to drought, wait until the fall rains start before planting, the seed loses viability rather quickly once planted and the fall flocks of birds love the grain.

The clovers are also a good selection for a winter cover crop. Most of the clovers are perennial, and thus can be a problem in the new fruit crop if allowed to establish. The clovers are a good cover crop of choice because they fix their own nitrogen in addition to producing a high biomass. One of the best of the clovers for nitrogen fixation is crimson clover. In addition it is one of the few annual clovers, although it will reseed itself if allowed to mature. The one drawback to crimson clover is the northern border for growing it runs through the Ozarks. In a severe winter it will winter kill, but it survived -4 degrees F a few years ago at Mountain Grove. Crimson clover is hard to find at most common farm outlets but they should be able to order a bag or two if wanted.

Red clover is a biennial clover, which is readily available locally. It is a good nitrogen fixer and biomass producer. It generally will not put up seed heads until late spring or early summer of its first year. Although I would recommend a fall planting it can be planted in the spring as a summer cover crop also. But be sure it is disked in before it matures its seed crop.

The sweetclovers are biennial in nature and can be used as a fall or spring cover crop. Our soils are generally too acid for them but where lime has been incorporated for the new crop they will produce good growth and biomass. The seed can be hard to find locally and must be ordered. The clovers in general produce hard seed along with soft seed. Hard seed can remain in the soil for years before germinating. Thus, do not let the clovers produce a seed crop before disking them into the soil or they can become a weed that will emerge in the fruit crop row for years to come.

**Summer cover crops:** These should be planted in May after the danger of frost is past. Good forage sorghums or their hybrids are an excellent choice for a cover crop. They can be cut two to four times during the summer and will re-grow from basal buds. This allows for the mowing down of any weeds that have emerged with the cover crop. Do not disk or turn the field until late summer or fall when the last growth is mown down. These forage grasses are relatively inexpensive, have a fast growth rate and will germinate with lower soil moisture than other alternatives. They will pull nutrients from deep in the soil but will give best growth with a nitrogen fertilizer although if planted after a crop of clover none will be needed.

Another good selection is the annual crop, buckwheat. Buckwheat is fast growing and matures seed rapidly. Buckwheat will mature in 40 days from sowing under normal conditions. After the crop is mown down the seed and plant matter should be disked into the soil. A new crop of buckwheat will then germinate and grow. Two or three crops of buckwheat can be grown through the summer. The chief advantage of buckwheat is its' rapid growth. Any weeds that emerge will be mown down and killed before it can produce a seed crop. With the disking of the ground a new set of weeds will emerge and the cycle starts again, thus reducing the number of weeds seeds without allowing production of a new crop of weed seed. For best production of buckwheat, fertilizer should be incorporated with the first sowing but there is no

need to fertilize later. Again, if the buckwheat is following a clover crop there is no need to fertilize.

There are several other crops, which can be used as a cover crop for new fruit planting sites. In the legume family there is soybeans, vetch, and subterranean clover. In the grasses there is ryegrass, barley, several different millets, and sudangrass. The characteristics to look for in a cover crop are the production of high biomass and an

annual (one-year) or biennial life (two-year) cycle. Remember that you can plant different crops together such as a legume with a grass. The purpose of cover cropping a new fruit crop site is to kill the present ground cover, to reduce the number of weed seeds, and to increase the organic matter in the soil, which will increase the nutrient and water holding capacity of the soil. (*Source: The Berry Basket, Vol. 4, No. 3, Fall 2001*)

## Meetings

### Ontario Berry Growers Association

*Feb 26-27, 2002*

*Hamilton Convention Center, Hamilton*

*Feb 26th, 9:00 a.m. - 5:00 p.m.*

Workshop "Management and More".

This program features an in-depth look at pest management and other crop management topics. The agenda is based on round-table discussions. Growers pick the topics that interest them most, and participate in discussion lead by guest speakers and local researchers. Pre-registration required. Call the OBGa at 905-649-2101

*Feb 26th, 7:30-9:00 a.m.*

"Getting started in IPM: Strawberries" and "Getting started in IPM : Raspberries" are concurrent sessions for new growers, or growers who want to learn more about pests and pest management in these crops. Learn how to identify the major pests, and when to expect them. Monitoring techniques and IPM based control methods will also be discussed. Pre-registration required. 905-649-2101

Feb 27th, 9:00a.m. -5.p.m.

Berry Day at the Ontario Horticultural Crops Conference: The program features the hottest topics of the season, including drip irrigation, cyclamen mite, and other pest problems. Find out what's new in berry varieties, and learn from the grower-to-grower interaction that is built right into this program.

Ontario Horticultural Crops Conference

*Feb 27-28, 2002*

Hamilton Convention Center, Hamilton, Ontario

The 2002 conference provides many events and programs of interest to berry growers.

For more information contact Deborah Melito 519-763-6320, or visit the conference website at <http://www.ontariohortcrops.org/>

February 27	February 28	Both Days
Berries	Organic Alternatives	Trade Show
Sweet Corn IPM Workshop	Food Safety	Weed Control Drop-in Clinic
Potato	Organic Soil Amendments	Poster Session
Vegetable Research	Apples	
	Vine Crops	
	Sweet Corn	

For coming events, refer to the [OMAFRA Horticultural and Field Crops Conferences and Meetings](#) webpage.

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