

Blueberry Weed Management

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The primary goal of weed management is to optimize yields by minimizing competition between the weeds and the crop. Weeds reduce yields by competing with the crop for water, light, and nutrients. Weeds also harbor insects and diseases and encourage vertebrate pests. Timely cultivation, wise use of herbicides, and never permitting weeds to go to seed are integral parts of a good weed management system. Many of the weeds found in these fields are difficult-to-control perennial weeds that are not common in annual crop culture. New plantings usually have fewer perennial weed problems than older plantings. Annual and biennial weeds can also exist in these fields. Fields should be scouted at least twice a year (spring and fall) to determine specific weed problems. The selection of a weed management tool should be based on specific weeds present in each field.

The most important weed management strategy is employed prior to planting that is, eliminating all perennial weeds. Fields that have been dormant or have been in pasture may have perennial weeds that are well established. Fields that have been in cultivation are less likely to have established perennial weeds in them. Common perennial weeds include common dandelion, Canada thistle, stinging nettle, field bindweed, field horsetail, goldenrod, and quackgrass. Once these perennial weeds become established or remain established in a berry field, they are very difficult to remove. The most common way to remove perennial weeds is with Roundup (glyphosate) applied in the fall prior to planting. Perennial broadleaf weeds should be treated after flowering but prior to a killing frost. Perennial grasses can be treated well into November.

Cultural weed management in blueberry plantings includes mulching, cultivation, and soil pH management. Mulching is a major weed management tool in blueberry production. Mulches that are free of weed seeds and placed thickly enough can be very effective at reducing or eliminating most annual weeds from the crop row. They are seldom effective on perennial weeds, however. Use of cultivation is difficult and often is counterproductive in blueberry plantings. It destroys surface feeding roots and does not work well where mulches are used. All cultivations should be timely and shallow to minimize crop root injury, to minimize loss of soil moisture, and to avoid repositioning new weed seeds to the soil surface. The low pH soil that blueberry plantings thrive in is not a good environment for most weed species. Keeping the soil pH at the right level will help to reduce weed pressure.

The areas between the crop row is usually maintained with a mowed cover of sod, clover, weeds, or a combination of these. This cover is used primarily for erosion control and to improve trafficability in the field.

Several herbicides are labeled for use in this crop. Herbicides can be broadcast or applied as a directed spray to the base of the crop. With a band treatment, only 1 to 2 feet on either side of the row is treated. With banding, less herbicide is needed in each acre. For example, a 3 foot band (1.5 feet on either side of the row) where rows are spaced 9 feet apart will require only on third

the amount of herbicide normally required for a broadcast treatment. Where mulches are used in combination with herbicides, use the lowest recommended herbicide rate to avoid crop injury. Herbicides registered in highbush blueberry production are listed below. "A" shows the advantages of each herbicide while "D" lists the disadvantages of each herbicide.

Soil Applied: annual grasses and some broadleaf weeds

Devrinol (napropamide): A= good control of most annual grasses and small seeded broadleaf weeds, very safe on new growth D= residual is 12 weeks which can be short, needs moisture to avoid breakdown on soil surface

Surflan (oryzalin): A= good control of most annual grasses and small seeded broadleaf weeds, safe on new growth, does not require moisture to avoid breakdown D= Residual is 12 weeks which can be short

Soil Applied: annual grasses and many broadleaf weeds

Solicam (norflurazon): A= good control of most annual grasses and many broadleaf weeds, safe on new growth D= residual is 12 weeks which can be short, needs moisture to avoid breakdown on soil surface

Soil Applied: many broadleaf weeds

Sinbar (terbacil): A= good control of many broadleaf weeds, some postemergence activity as well D= leaching issues but most applications are banded which minimizes use

Princep (simazine): A= good control of many broadleaf weeds, some postemergence activity as well D= leaching issues but most applications are banded which minimizes use

Soil Applied: annual and perennial broadleaf weeds

Velpar (hexazinone): A= good control of many tough broadleaf weeds including wild brambles and goldenrod D= highly leachable, growers should not use this product every year and should band sprayed

Casoron (dichlobenil): A= good control of many annual and perennial broadleaf weeds, granule formulation is more effective than wettable powder, granule formulation reduces leaching concerns D= granule formulation is difficult to apply

Postemergence: annual and perennial grasses

Fusilade (fluazifop): A= very safe on crop, good control of annual grasses D= fair control of perennial grasses and cool season grasses

Poast (sethoxydim): A= very safe on crop, good control of annual grasses D= fair control of perennial grasses and cool season grasses

Postemergence contact: grasses, annual broadleaf, perennial burndown

Scythe (pelargonic acid): A= safe on the crop, fast and effective weed burndown D= very expensive, offensive odor, contact only, no residual activity, brief control of perennial weeds

Gramoxone (paraquat): A= safe on the crop, fast and effective weed burndown D= very expensive, offensive odor, contact only, no residual activity, brief control of perennial weeds

Flaming can also be included in this category. Advantages and disadvantages are similar as with the above two herbicides. In addition, cost and effectiveness are intermediate between the above two herbicide options.

Postemergence translocated: grasses, annual and perennial broadleaf

Touchdown (Sulfosate): A= very effective on annual and most perennial weeds D= potential for crop injury, no residual activity

Roundup (glyphosate): A= very effective on annual and most perennial weeds D= potential for crop injury, no residual activity

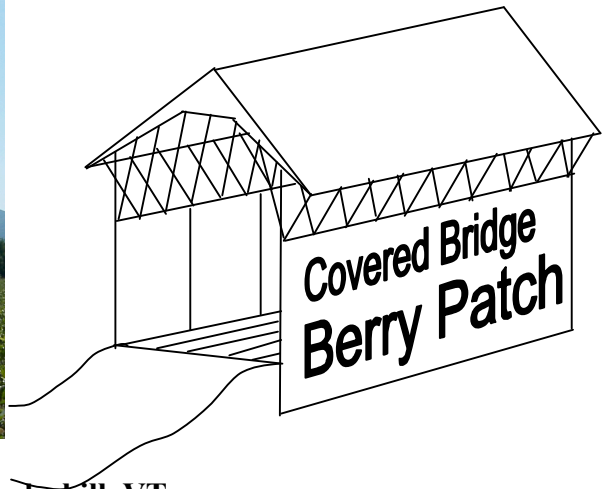
Other options

Cultivation: A= effective on all emerged weed growth D= not effective in wet soils, not effective when mulch is used, quick regrowth of perennial weeds

Mulches: A= effective on annual weeds when applied at the right thickness D= not effective on perennial weeds, not effective when adjacent weeds drop seeds and contaminate mulch

Overall, weed management options are sufficient and effective. Using mulches and herbicides in the crop row combined with mowing in the row middles results in the most effective control of weed pressure, minimizes competition with the crop, and maximizes crop yield.

A Tour of **Covered Bridge Berry Patch**, a Small U-Pick Blueberry Grower in Underhill, Vermont



Bird Control at Covered Bridge Berry Patch, Underhill, VT
Note disks suspended above blueberry bushes.

The **Covered Bridge Berry Patch** is located in a rural area of suburban Burlington, Vermont. We have about 3 acres of U-Pick blueberries planted in the spring of 2001. Our berry patch is within 15 miles of two major, well established, U-Pick blueberry producers, one an exclusive grower of blueberries, the other has U-Pick blueberries as a part of production of a wide variety of farm fresh produce. Most of our customers come from a radius of 10 miles, most in directions away from the other U-Pick blueberry farms. An advantage that we have is to be adjoining neighbors of **Chamberlin's Garden and Farm Market**. Paul and Joan Chamberlin grow and market a wide variety of produce including U-Pick strawberries. For the past several years their strawberry patch has bordered our driveway. Their strawberry customers use our driveway to access the strawberry selling stand.

This proximity has proven to be fortuitous for at least three reasons. First, we were able to hire Paul to do the heavy work of plowing and working up the soil for the blueberry planting, laying the drip irrigation tubing and plastic mulch. Second, we place flyers at their strawberry selling stand that is parked along our driveway thereby alerting U-Pickers that blueberries will be available in a couple of weeks. And, third, we sell pre-picked blueberries at their store. This is a very good way to highlight the existence of locally grown blueberries. This past summer, a pre-picked pint sold for \$3.25 at Chamberlin's whereas the U-Pick price, just across the bridge, for a quart is the same price. We also sell a few pre-picked quarts at the field for \$6.50.

In addition to the advertisements at the Chamberlin, and having a "Blueberry" sign at the road, we invite customers to leave their email address for a season opener announcement. We promise to only send opening and closing emails, and to not sell the list. This has worked very well beyond the problems that come with maintaining such a list while changing software packages.

Irrigation is supplied by drip tubing that was laid down at the time the blueberries were planted. The water comes from a shallow well just outside the outer bank of the river that borders the blueberry patch. We use an electric pump rated at 10 gal/min. The electricity is supplied from

the house about 500 feet away. The water is piped to the middle of the field where there is a 6-way manifold. This allows controlling the water supply to each of 6 approximately equal sections. In practice, we typically water 2 sections at a time. This effectively divides the patch into three sections. This turns out to be useful since the soil, although rather uniform, does vary from a sandy loam to a more sandy soil. As has been reported by many growers, irrigation appears to be a necessity for growing large tasty blueberries. Even if the rain meets the seasonal requirement, it does not come on the needed schedule.

The field had been in hay prior to our planting blueberries. The many years of hay allowed a very good supply of (weed) seeds to be deposited. Our attempt to counter this was to use plastic mulch through which the blueberries were planted. This did help, but some of the weeds even came through the plastic and after the plastic was removed the second year there was plenty of seeds in reserve to overwhelm us, especially grass. That helped us see the wisdom of glyphosate. Some hand weeding around the plants is still required.

The other result of the haying operation is that lime was continually added, especially in the part of the field that had been used for our family garden. Even though we thought we added sufficient sulfur prior to the blueberry planting, the pH remained close to 6.0. After additional sulfur each year as recommended, the pH is closer to 5 than 6. We are still trying to work it down.

Of the four varieties of blueberries in our patch, about two-thirds of the berries come from two cultivars, Patriots and Toro.

The other two varieties, Nelson and Bluejay, had a cane disease (assumed to be phomopsis) that affected about 1/4 of the plants from about year two through five, many to the extent that most of the canes were pruned to the ground. Our principal control of this disease is that of pruning any affected cane although we began spraying lime-sulfur this past spring. The cane disease appears to be on the way to being controlled this summer. It affected canes in about 10% of the plants in the part of the patch where nearly every plant had been affected a couple of years earlier. Even in the part of the patch where the Bluejay were not hit by the cane disease, the yield was about 1/2 that of the Patriot and Toro bushes. The Nelsons were also somewhat less in yield, but were enough later in the season to not be fully ripe when the Patriots and Toro were picked out. Judging from the number of flower buds this fall there will be a good crop of berries on the Patriot, Toro, and Nelson next year. It appears that the Bluejay will not be a good producer again next summer.

One of our major time demands in blueberry maintenance is pruning. The rules that we currently use for pruning, listed by priority, are:

1. Remove all canes or part of a cane that has an unhealthy appearance. If only a tip is involved, cut back to the main stock. If the main stock is involved, cut as close to the ground as possible. Do this as soon as noticed.
2. Remove any cane or branch that is not within 10 degrees of upright at ground level, or within 20 degrees of upright at half-height up the plant. (This is not as rigorously followed for the Toro with its fewer, stronger canes.) The top of the plant has no directional limit.

3. Remove old, large canes that are beyond their fruiting prime. If in doubt, look for the number of flower buds.
4. Remove any cane or branch that is in contact or near contact with another cane or branch. In general, remove the younger cane or branch, but try to leave the cane or branch with the most productive potential. This rule is extended to any new branch, or cane that is growing in a direction such that it will cross the path of another at some future time.
5. Remove canes, but especially branches that are below two-thirds plant height, if leaves will not receive at least 30% sunlight over the day, or if air circulation through the plant will be greatly reduced when leaves are full.

We have generally found that even with some fall pruning, we are not able to complete pruning before flower formation. Among other disadvantages, this highlights the feeling of throwing away berries.

Especially with the Nelsons, it was almost disastrous to interpret the “book” guidelines as not needing to prune the second year. Many new canes grew in the first and second year, but they were close together and grew in all directions. This resulted in an interlocking tangle that was very difficult to prune. The Toro were least affected since they tend to grow more upright and produce fewer canes each year. Pruning must be done in response to the plant condition and form and the desired plant shape three or so years later. Think in terms of upright canes with branches in the top ¼ of the plant.

As noted in the photograph at the top, we use discarded CDs and DVDs hanging 10 to 15 feet above the plants for bird control. The CDs are spaced approximately 30 feet apart on a string or fish line with the strings being approximately 50 feet apart. Our estimate is that we lose less than 1% of the berries to birds. The loss is 2 to 3% in the area that is nearly surrounded by trees giving the birds the best sanctuary. Deer frequent the patch, but have done very little damage. We lost at least one young plant when it was stepped on by a moose. We find bear scat in the driveway near the patch every other year or so, but have seen no evidence of berries eaten, or plants harmed.

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