

Integrated Control of Perennial Weeds Before Planting New Orchards

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Weeds cause serious crop losses every year by reducing yield, quality and earliness of grain, forage, vegetable and fruit crops. Perennial weeds include any weed that lives for more than two years. Common perennial grass weeds include quackgrass, Johnsongrass, Bermudagrass, and wirestem muhly. Common herbaceous perennial broadleaf weeds include Canada thistle, milkweed, hemp dogbane, hedge and field bindweed, Canada goldenrod, white heath aster, and horsenettle. Common woody broadleaf perennials include Virginia creeper, poison ivy, creeping dewberry and other brambles, multiflora rose, greenbriar, and mulberry tree seedlings. Yellow nutsedge and purple nutsedge are two perennial sedges commonly found in the region.

Most annual and perennial weeds reproduce from seed, but many perennials also reproduce vegetatively. Examples of vegetative reproductive parts of weeds include stolens, rhizomes, roots, tubers, bulbs, and nutlets. Bermudagrass has stolens, which are above ground horizontal stems. Quackgrass spreads by rhizomes, which are underground horizontal stems. Canada thistle, milkweed, hemp dogbane, horsenettle, and bindweed species have a deep complex root system with distinct vertical and horizontal roots. Wild bean has tubers. Nutsedge has nutlets that can live dormant in the soil for several years. Knowledge of the life-cycle and vegetative reproduction of the perennial that needs to be controlled is a key to success.

Primary and secondary tillage are effective control methods for annual weeds, but annual plowing and disking or field cultivating prior to planting often only spreads perennials by breaking roots, rhizomes, and stolens, and dragging pieces to uninfested parts of the field, or to other fields. Perennial weed control requires a significantly higher degree of commitment by the grower. The grower must make perennial weed control a high priority task. They must recognize that success will require more time, cost more money, and may affect a field's crop rotation sequence to be effective.

Perennial weeds can be controlled by carbohydrate starvation. Perennials emerge in the spring by relying on carbohydrates stored in roots, rhizomes, stolens, tubers, bulbs or nutlets. Control measures should start when the carbohydrate reserves in the weed are at their lowest. This is often after the weed has used stored reserves to overwinter and emerge in the spring. Beginning when the weed shoot(s) break the soil surface, carbohydrate flow continues from the root toward the shoots for an additional 7 to 10 days to establish a leaf canopy. Between 10 and 14 days is a transition period. Within 14 days of emergence, the weed moves carbohydrates from the leaves back down into the root.

STARVATION OF PERENNIAL WEEDS IS ACCOMPLISHED BY NEVER ALLOWING THE WEED TO MOVE CARBOHYDRATES DOWN INTO THE ROOTS. This can be accomplished by tilling (or close mowing of tall upright weeds) every 7 to 10 days until they cease to attempt to emerge. It is critical that NO timing be missed or be late! One single missed tillage can negate all the effort expended up to that point. **EXPERCT TO CONTINUE THE EFFORT FOR 4 TO 6 MONTHS!** Success may require more time if the effort was not started when carbohydrate reserves in the weed were low at the start of the process.

Typically, a field is fallowed and shallowly tilled on a weekly schedule for one growing season to eliminate a perennial weed problem. Begin with the first sign of the emergence of the weed in the spring. Maintain a seven (7) day tillage schedule. This time schedule provides about a three to seven day cushion in the event of a wet period when the field cannot be tilled. The schedule **MUST** be maintained and must be a high priority for the grower. One, single missed tillage can negate all the effort expended up to that point. Advance the schedule when wet weather is anticipated rather than suffer a delay. Preventing ANY carbohydrate from moving from the leaves back into the root is critical for success until the weed is dead.

A field need not be fallow for the year, provided the grower maintains the seven day cultivation and hoeing schedule. The weekly tillage cannot be stopped when the crop becomes established. The weekly tillage and hand hoeing must be continued until the weed is dead.

A crop rotation can be designed to target a specific “hard to control” weed such as Canada thistle or yellow nutsedge in crops prior to planting an orchard. By choosing crops that allow the weed to be treated with effective herbicides repeatedly, and/or a rotation that provides the opportunity to control the weed during the reproductive time of year, improved weed control can be obtained.

Yellow nutsedge is the number one weed in horticultural crops worldwide. The weed sprouts from tubers and grows vigorously, spreading with rhizomes that curve upward initiating new plants in late spring and early summer. When the nights begin to lengthen in early August, yellow nutsedge initiates a new burst of rhizome growth. These rhizomes grow angling downward, and by early September, the tips swell and produce new tubers. As the nights lengthen further in early fall, the weed senesces, and the new dormant tubers sprout randomly in the late spring in following years.

The key to controlling yellow nutsedge is preventing new tuber formation for several years, which occurs in August and early September. Planning a crop rotation in the years prior to planting an orchard so that the crop is harvested before August and tillage can be used to keep the field nutsedge free in late summer, or the planting of crops that can be treated with herbicides that effectively control nutsedge can eliminate the weed as a problem in the field. Dual Magnum, Basagran, and Sandea are among our most effective yellow nutsedge herbicides and are labeled in commonly grown field crops and many vegetables. For example, a vegetable crop rotation of early cucumbers treated with Sandea, followed by late summer snap beans treated with Dual Magnum and Basagran in year 1, followed by tomatoes treated with Sandea in year 2, early sweet corn treated with Dual Magnum and Basagran followed by tillage in year 3, and pumpkins treated with Sandea in year 4 targets yellow nutsedge in every crop. Four years without tuber production can reduce the yellow nutsedge population in a field to where it is only an occasional weed that can be cultivated or rouged by hand weeding. After the orchard is planted, Matrix in stone fruits and Sandea in apples will control yellow nutsedge.

Many herbaceous perennial weeds, including Canada thistle and other composite weeds, milkweed species and hemp dogbane, and bindweed species can be controlled by rotating to corn for two years prior to planting an orchard and applying 2 to 3 quarts of Banvel in the fall before planting corn in year one, 2 quarts in the fall before planting corn in year two, and applying Banvel at labeled rates early postemergence in the corn both years. Banvel is a residual herbicide with a long life in the soil which prevents weed growth the year after use in the fall. Do not exceed maximum labeled Banvel rates in your state.

Canada thistle is a herbaceous perennial weed with deep spreading roots. Control can be obtained with a glyphosate product, with Stinger, or Basagran. Glyphosate products are effective when Canada thistle is in bloom in early summer, and in early fall on fall regrowth of the weed. Basagran is labeled in corn, sweet corn, edible beans, and peas. Stinger is labeled in corn, sweet corn, cole crops, stone fruits, and strawberries. Stinger is the most effective herbicide for Canada thistle control. Three applications, spaced 60 to 75 days apart, beginning in the spring when Canada thistle is just emerging is most effective. The second and third applications are important and must be applied, even if no thistle is evident 60 to 75 days after Stinger was applied. Do not exceed the maximum rate allowed per acre per year.

Goldenrod and perennial asters are herbaceous perennial weeds with spreading roots. Control can be obtained with a glyphosate product or Stinger. Glyphosate products are effective when the weeds are in bud or bloom in the summer. Stinger is labeled in corn, sweet corn, cole crops, stone fruits, and strawberries. Stinger is most effective in the spring when the weeds are just emerging. Up to three applications, spaced 60 to 75 days apart, beginning in the spring is most effective. The second and third applications are important and must be applied, even if no weed growth is evident 60 to 75 days after Stinger was applied. Do not exceed the maximum rate allowed per acre per year.

Common milkweed and hemp dogbane are herbaceous perennial weeds with deep spreading roots. Control can be obtained with a glyphosate product or with Starane Ultra. Glyphosate products are effective when the weeds are in bloom in midsummer. Starane Ultra is labeled in corn, sweet corn, small grains, and apples. Starane Ultra is the most effective herbicide for the control of common milkweed and hemp dogbane. Two or three applications, spaced 60 to 75 days apart, beginning in the spring when the weed has emerged and is growing vegetatively is most effective. The second and third applications are important and must be applied if regrowth is evident. Follow all label instructions and do not exceed the maximum rate allowed per acre per year.

Field and hedge bindweed are herbaceous perennial weeds with deep spreading roots. Control can be obtained with a glyphosate product or with Starane Ultra. Glyphosate products are effective when the weeds are in bloom in midsummer. Starane Ultra is labeled in corn, sweet corn, small grains, and apples. Starane Ultra is the most effective herbicide for the control of bindweed species. Two or three applications, spaced 60 to 75 days apart, beginning in the spring when the weed has emerged and is growing vegetatively is most effective. The second and third applications are important and must be applied if regrowth is evident. Follow all label instructions and do not exceed the maximum rate allowed per acre per year.

Woody trees, bushes, and vines are more susceptible to tillage prior to planting an orchard, especially in the summer and early fall before “color” when dry soil conditions prevail. Control can be obtained with a glyphosate product or a triclopyr product such as Garlon and other trade names. Glyphosate products are effective when the weeds are in bud or bloom in late summer or early fall. The optimum time to treat is about two weeks before any fall color is observed on the target species. Triclopyr products are most effective for the control of most woody perennials, and should be applied in late summer or early fall up to within about two weeks of fall color on the target species. Triclopyr products are labeled for use on non[crop lands, turf and pastures. When sprayed, use the 3A (amine) formulation. Excellent coverage is needed. When applied as a cut stump treatment, use the 4E (ester) formulation according to label and be sure the stump is treated immediately after cutting. Confirm that triclopyr products are labeled for use in your state.

Residual herbicides have a section on the label that lists the period of time that must elapse between application and the planting of other crops in the rotation. A table summarizing the plant-back restrictions for most herbicides is included in the Commercial Vegetable Production Recommendation guide used in the mid Atlantic states. Use this table when planning crop rotations and weed control programs BEFORE applying herbicides!