USING CROP ROTATIONS TO MANAGE WEEDS

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Crop rotation is beneficial for many different horticultural, soil, and pest control related reasons. Producing different crops at different times of the year provides an opportunity to utilize different or left over nutrients and soil moisture. Using a legume crop in the rotation can increase soil fertility by the legume crops ability to fix and store nitrogen. Alfalfa's deep tap root can penetrate and break up a hard pan in the soil profile. Perennial grass hay crops increase soil organic matter and improve soil structure when they renew their root systems twice annually. Crop rotation can have a significant impact on plant disease pressure or insect pressure in a field.

The affects of crop rotation on weeds is less apparent. Certainly a field that is plowed and tilled annually in early and mid spring for years will exhaust the seed bank of winter annuals that bloom and set seed in late spring. More commonly, crop rotations are chosen to reduce disease or insect problems, or to improve soil fertility and tilth. The herbicides used in each crop should be chosen to control the weeds in that field and not carry over to affect the next crop. The use of herbicides with rotation restrictions can limit the choice of crops that can be planted the following year.

A crop rotation can also be designed to target a specific "hard to control" weed such as Canada thistle or yellow nutsedge. 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.

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. A crop rotation of early season snap beans treated with Basagran, followed by fall broccoli treated with Stinger in year 1, sweet corn treated with Stinger, followed by a glyphosate product in early fall in year 2, and by matted row strawberries, treated with Stinger in year 3 can control Canada thistle.

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 so that the crop is harvested before August, so 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 nutsdge can eliminate the weed as a problem in the field. Dual Magnum, Basagran, and Sandea are among our most effective yellow nutsedge herbicides. A 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.

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! Consider using herbicides that have no or short plant-back restrictions, or herbicides labeled for used on likely follow crops to increase crop rotation flexibility.

For example an early cucumber crop treated with Command and Sandea should have very good weed control, but late summer follow crops would be limited to snap beans. If Prefar was used in the cucumbers, weed control may not be quite as good, but late summer follow crop options would be numerous. Lettuce crops, onion crops, cole crops, parsley, and summer squash or a second cucumber crop (not recommended) are among the crops that are listed on the Prefar label. Consult your local Cooperative Extension Agent for additional help choosing crop rotations.