ALTERNATIVES FOR PURPLE AND YELLOW NUTSEDGE MANAGEMENT

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Purple and yellow nutsedge are two of the world's worst weeds. These perennials have a remarkable ability to survive adverse conditions and then grow explosively when the land is planted to irrigated crops. Losses can result when nutsedges compete with crops to decrease yield or directly damage below-ground plant parts such as onion bulbs. Nutsedge can even decrease property values, because potential tenants know that it is nearly impossible to eradicate the weed once established.

The nutsedges produce both seeds and tubers, but most reproduction is by tubers. The tubers may be thought of as a resting stage that allows the weeds to survive adverse conditions. Many people say tubers can survive almost anything. In fact, a large percentage of tubers are often killed during dormancy, but even only one percent of the tubers from a previous infestation are more than enough to bring back the population of these prolific weeds.

Understanding nutsedge control begins with the realization that tubers are the key to the weed's survival. Prevent tuber production, and you eliminate the weed. But the tubers can remain dormant and impervious to pesticides for years. Control programs should be aimed at preventing the formation of tubers through prevention of growth of nutsedge plants. If no new tubers are formed, tuber mortality will eventually eliminate nutsedge problems.

The best control of nutsedge is often obtained by growing competitive crops. Nutsedge is susceptible to shading, and crops that quickly form a dense canopy can out compete the weed. Sudangrass, corn, and wheat are crops that have been suggested as able to shade out nutsedge. Conversely, melons and other warm season crops that do not shade the ground may be overrun by nutsedge infestations. Farm advisors Carl Bell, Jose Aguiar, and myself looked at potential rotational crops that could be grown during the summer to shade out nutsedge, and then followed with winter vegetables. A field so heavily infested it looked like a purple nutsedge lawn was planted with sudangrass. By midsummer, the dense sudangrass canopy had killed emerged nutsedge. Several growers have eliminated nutsedge as a pest by using summer rotations of competitive crops over several field seasons.

Tillage can be effective at reducing nutsedge populations, but it must be done thoroughly and often. Tillage should not be so deep as to bring additional tubers close enough to the soil surface that they germinate. To prevent tuber formation, cultivation must be done frequently, before the plants are have more than three leaves.

The order of field operations should be:

1) Form the beds.

2) Irrigate to germinate the tubers.
3) Cultivate to kill plants before they emerge.
4) Plant the crop to moisture.
5) Continue cultivation throughout the growing season.

Approaches that integrate several control methods have the best chance of effectively managing nutsedge. Irrigation and tillage can break tuber dormancy, encourage sprouting, and make nutsedge susceptible to fumigants and other herbicides. A control program recommended by the University of Arizona starts by fallowing the ground during July, when nutsedge is actively growing. Begin with a pre-irrigation to end dormancy and cause the nutlets to sprout. This initial flush of nutsedge is allowed to grow until soil moisture is depleted, generally about 3 weeks after nutsedge emerges. Shallow tillage such as disking will kill emerged nutsedge and help desiccate shallow tubers. EPTC is applied to the dry soil at 3.5 pints per acre and immediately incorporated. Make two applications of EPTC to heavily infested soils. The ground is then prepared to establish the crop, and irrigation water applied. Consult the EPTC label for how long to wait before planting the crop, as EPTC injures many crops.

Crops may also interfere with nutsedge through allelopathy. Allelopathy occurs when the crop produces a chemical that decreases nutsedge's growth. Sweet potato root and shoot tissue has been shown to contain a chemical that is allelochemical toward yellow nutsedge.

Fumigants are the principal weed control method in some vegetables and other high value crops. Fumigation with methyl bromide or Vapam will not kill dormant tubers. Efficacy can be improved if tillage and irrigation are used prior to fumigation to sprout dormant tubers. Tarping the field and applying Vapam through drip systems will also help kill tubers that are actively growing but buried deeper in the soil. Incorporating metham sodium as it is applied also helps to evenly distribute it throughout the soil.

Solarization is a nonchemical soil sterilization method. A clear plastic tarp is used to cover the soil and raise temperatures high enough for pastuerization. Solarization is often reported as ineffective in controlling nutsedge. However, we observed what appeared to be significant control of emerged purple nutsedge in our Coachella Valley experiments, although we do not know the effect on tuber production. It may be possible that by carefully timing when solarization is initiated will make it somewhat effective for nutsedge control.

In summary, yellow and purple nutsedge have earned the right to be considered among the world's worst weeds. The key to nutsedge control is to prevent tuber production, and stimulate dormant tubers so that they will be susceptible to control. Eptam and fumigation treatments can give some control, but can only be used when no crop is present. The best cultural control is to grow a crop that forms a dense canopy during the summer when nutsedge is actively growing.

Proceedings of a conference on nutsedge biology and management in field, vegetable, vine, tree, turf and ornamental crops can be found on the World Wide Web at: http://cnas.ucr.edu/%7ebps/hnutsedge.htm.