WEED CONTROL IN POTATOES

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For maximum yields of high quality potatoes, growers must control weeds. Weed competition at all stages of potato growth reduces yield, but is most detrimental during the first eight weeks after potato emergence. In addition to competing with potatoes for light, moisture, and nutrients, weeds harbor pathogens and insect pests that attack potatoes. Weeds at harvest time increase the number of tubers left in the ground, increase mechanical damage to the tubers, increase the number of tubers carried over the deviner chain with the vines and slow down harvesting.

An effective weed control program takes into account the primary weed problems, crop rotation, cultivation, available herbicides, and competitive ability of the potato crop. Although weed problems may be quite specific to given fields, they can be categorized into theee main classes: broadleaved annuals, annual grasses, and perennials. Annuals are the easiest to control with cultural and chemical methods. An application of a preplant or preemergence or early postemergence herbicide in addition to cultivation, if and when needed, provides effective early season weed control. As the potato crop develops a dense canopy, it becomes more competitive often crowding out or shading later germinating weeds. When the vines "go down" the shading effect is lost and new weeds may germinate. Generally these weeds do not present much of a problem as far as reducing yields but often constitute a major problem during harvest.

It is easier to control weeds before they infest a crop than afterward. New and troublesome weeds can be introduced by: 1) planting seed pieces with weed seed adhering to them; 2) irrigating with water carrying weed seed; and 3) tillage and harvesting equipment. It is possible to prevent a serious problem with perennial weeds by examining a field before planting and selecting fields that are free of perennial weeds. If perennial weeds are present, control of these weeds before planting potatoes is usually a good investment. Once perennials are found growing in the potato crop, little can be done to control them until after harvest except by roguing and cultivating.

Weeds often found in Washington potato fields include both annuals and perennials. Annual weeds most often found include redroot pigweed, lambsquarters, hairy nightshade, Russian thistle, barnyardgrass, and foxtail. Other annual weeds which are troublesome, including puncturevine and sandbur, are also found in some potato fields. Perennial weeds most often found in Washington potato fields are quackgrass and Canada thistle. Yellow nutsedge has been found in the lower Columbia Basin and the Yakima Valley and may be a very serious problem in future potato production. Yellow nutsedge rhizomes have been found to penetrate potato tubers causing severe reduction in quality.

Weeds of the nightshade family may not seriously reduce potato yields; however, they should be controlled because they are of the same plant family as potatoes and are an alternate host for many of the diseases, insects, and nematodes that attack potatoes.

Cultural Control

Weed problems can be reduced by establishing a vigorous stand of potatoes. Moisture stress, low fertility, diseases, insects, nematodes, improper seedbed preperation, soil compaction, and poor seed pieces all contribute to weaken potato plants and increase weed problems. Stands of potatoes that emerge and grow rapidly are usually less weedy than are less vigorous stands.

Rotating potatoes with other row crops, small grains or alfalfa is an effective way to reduce weed growth. A good rotation for weed management should include strong competitive crops with an active weed control program in each. Rotation affords the use of a variety of weed control methods to reduce weed-seed populations in the soil and control weeds that are difficult to control in potatoes.

Mechanical Weed Control

In the past, growers have relied primarily on hand labor and cultivation for weed control. Costs for hand labor have increased dramatically in recent years. Cultivation is costly, time and energy consuming, and promotes germination of a new crop of weeds while controlling the existing one. Moreover, excess cultivation is associated with damage to soil structure, injury to potato foliage and roots, loss of soil moisture and spread of pathogens.

Mechanical weed control is not all bad. Since potatoes are planted relatively deep and are often "hilled-up" or "dragged-off". Cultivation is an effective method to control annual weeds early in the growing season. Cultivation is often the only method of controlling both perennial weeds in the growing crop and annual weeds not controlled by herbicides.

Care should be taken not to spread rhizomes or other vegetative reproductive segments of perennial weeds from infested fields to noninfested fields with planting, cultivating, and harvesting equipment.

Chemical Weed Control

In the past 10 years, herbicides have come to the forefront in controlling weeds in potatoes. Herbicides are often used to control weeds in potatoes in conjunction with mechanical and cultural practices. *A herbicide program in the absence of good cultural practices is seldom satisfactory.* Maximum benefits are obtained when herbicides are used in conjunction with recommended cultural and mechanical practices.

If herbicides are used, the choice of which one or ones to use must be tailored to the kinds of weeds present and when these weeds germinate. The method and rate of application should be in accordance with the manufacturer's label and local recommendations.

Methods of application vary from preplant soil incorporation, preemergence to post-emergence. *The application method will vary depending on the herbicide.* Some may be applied by ground rig, airplane, and/or through irrigation systems.

Specific herbicides, rates and methods of application are constantly changing. Consult your local agricultural authorities for current recommendations. The herbicides most commonly currently being used in Washington potato production are: alachlor (Lasso), EPTC (Eptam), trifluralin (Treflan), metribuzin (Lexone, Sencor), and combinations of some of these products.

The following table is provided for general information on the type of weed control that can be expected from selected herbicides used in potato production. Response of both weeds and potatoes to any of the listed herbicides may be altered by growing conditions, weed population, type of irrigation, genetic varieties in potatoes or weeds, soil type, pH, organic matter, time of application, and application rate. Ratings may vary from season-to-season and geographic areas within the state. Weed control generally decreases as the season progresses.

COMPARATIVE WEED AND POTATO RESPONSE TO SELECTED HERBICIDES

	Alachlor	EPTC	Trifluralin	Metribuzin	Trifluralin + EPTC	Alachlor + Metribuzin
Barnyardgrass	E-G	E-G	E-G	G-F	E	E
Black Nightshade	G	G-F	P	F-P	G-F	G
Crabgrass	E	E	E	G-F	E	E
Foxtail	E-G	E	E	G-F	E	E
Hairy Nightshade	E	G	P	F-P	G	E-G
Kochia	P	F	F	G-F	G-F	
Lambsquarters	G-F	G	G-F	E	E-G	E
Pigweed	E-G	G-F	G	E	E-G	E
Russian thistle	P	P	G-F	E	E-F	E
Sandbur	G-F	E	G	F-P	E-G	G
Smartweed	P	P	F-P	E-G	P	G
Sunflower	P	P	P	G-F	P	F-G
Potato Tolerance	G	E	G	G	G	G-E

E = Excellent 90-100% control
G = Good 70-90% control
F = Fair 50-70% control
P = Poor 0-50% control