

## **WEED CONTROL**

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### **INTRODUCTION**

Weeds compete with the crop for light, nutrients and moisture. Some may release toxic chemicals, which may adversely affect the crop growth, while the inclusion of undesirable weeds during harvesting can reduce crop quality and appearance. Even with good farming practices weeds may reduce the crop yield by 10% to 20%, but, if poorly controlled, they can reduce yields by as much as 80%.

The impact of weeds on crop yield varies according to the weed species present, their density and their persistence during the cropping cycle. In general, weed competition during the early stages of crop growth is much more harmful than during the later growth stages. For most vegetable crops, near optimum yields can be achieved when weeds are adequately controlled for the first six to eight weeks of the life of the crop.

The longer weeds are allowed to grow, the greater will be their yield-reducing effect, and the larger and stronger they are, the more difficult they are to control. It is thus usually easier and more economical to control weeds before emergence, or when they are at a very young stage of growth. A major failing on the part of many growers is to commence weed control too late - when weeds are already well-established. Early control is essential for best results; there is less competition with the crop, and the weeds are still tender and more easily killed.

### **CULTURAL PRACTICES**

Effective strategies necessary for satisfactory weed control include:

- selection of fields for cropping which have fewer weeds, especially nutsedge and other aggressive weeds;
- rotating crops which may allow a different spectrum of herbicides to be used, or demand cultivation practices to be carried out at different stages of plant growth;
- planting crops at times when specific weed problems are reduced;
- promoting a dense crop canopy early in growth - such a canopy may smother or shade out later-emerging weeds. The early crop canopy may be ensured by planting at the optimum time for that crop, high plant populations and sound fertilizer practices, or other measures which would stimulate vigorous crop growth;
- reducing weed seed formation. Weeds on production lands and on the edges of cultivated fields could be prevented from seeding, either mechanically or by chemical means. Weeds on fence lines, headlands and contour banks should also receive attention; and
- destroying all weeds in the field by ploughing as soon as a crop has been harvested.

#### **Soil preparation**

It is often possible to destroy one or more flushes of weeds while preparing the land before planting, particularly when soil preparation starts some while before planting. In such circumstances the final cultivation should be as shallow (less than 20 mm) as possible, to avoid bringing fresh weed seeds closer to the soil surface where they can germinate.

### **Mechanical and hand weeding**

When mechanical control or hand-hoeing is practised, the tillage should not be done too early in the morning, at which time the crop plants are still turgid and may be damaged easily. Disturbed weeds will, in any event, wilt and die more easily under hotter conditions. Soils should preferably also not be too wet, because cultivation under such conditions will tend to "transplant" the weeds and may also smear the soil. Cultivations should also be shallow and not too close to the crop plants, to avoid harming the crop. Where hand-hoeing is practised, the use of the Dutch hoe is preferred to any other.

### **CHEMICAL CONTROL**

The high cost of skilled and hand labour has caused growers increasingly to turn to chemical weed control rather than to rely on cultivation and hand hoeing or pulling weeds. Unfortunately chemicals alone seldom perform so efficiently that other measures become unnecessary. A few weeds invariably escape the spray, and individuals of weed species resistant to the chemical applied begin to increase. One early, shallow cultivation often solves both these problems and benefits crop growth and development. However, soil disturbance may reduce the efficiency of certain pre-emergent herbicides where a total soil surface cover is essential for good control of emerging weeds.

Herbicides are chemicals which have been developed to kill plants. Some herbicides will destroy all plants treated, whereas others will kill only certain plants. The choice of herbicide for a particular field is dictated essentially by two factors, viz. the kind of vegetable to be grown, and the species of weeds that need to be controlled. It is well to remember that only those herbicides registered for use on a particular crop may, by law, be used on that crop. Because specific herbicides normally control only certain weeds, the correct identification of the predominant weed species occurring in a field is a most important factor in selecting the best herbicide for use. There is no point in applying a grasskiller when the main problem is caused by broad-leafed weeds, and vice versa. It must also be realised that some herbicides will, for example, destroy certain broadleafed weeds and not others. Furthermore, using too high a dosage than the recommended rate in order to kill more weeds, could perhaps damage the crop. It is thus most important to use the herbicides strictly in accordance with the information supplied by the manufacturer. Read the label carefully and diligently follow all the instructions for use.

Post-emergent herbicides work most effectively on young, vigorous, actively-growing weeds. Control is often poor on older weeds or where growth is retarded because of drought or other stress factors.

There are many situations in which some of the weed species present cannot be controlled chemically. However, by judicious rotation of crops and the selection of a chemical to which the main weeds present are susceptible, such weed problems can frequently be overcome. Thus, crop rotation and herbicide changes together form a simple, effective method for obtaining good weed control in the long term.

### **Herbicides in combination or alone**

Growers are often under pressure to accomplish all their necessary tasks. Consequently, they may feel that combining herbicides and other pesticides or fertilizers will save at least one operation in their programme.. Most such combinations of chemicals are **not** recommended.

They frequently lead to inferior control or to crop injury. A particularly risky practice is combining liquid fertilizer and post-emergent weed killer.

On the other hand, other **recommended** combinations of herbicides have proved highly effective. Their combined effect, even at relatively low dosage, is sometimes greater than when each is used alone. A larger variety of weeds may also be controlled with combinations than with single chemicals.

It is sometimes desirable to use more than one chemical on a particular crop for the most satisfactory weed control. For example, EPTC may be used pre-plant for nutsedge and annual grass control, followed by bendioxide, used post-emergence, for broadleaved weed control in green beans.

### **Stale seedbed technique**

In several vegetables, such as direct-seeded vine crops, weed control is difficult because there are no really satisfactory selective herbicides available. A "stale seedbed" technique often helps in these situations. This procedure involves the following steps:

- preparing the soil in the usual manner, but perhaps a little earlier than normal;
- irrigating the land to encourage weed emergence;
- allowing the land to lie fallow for up to two weeks to allow most weeds to emerge;
- spraying with a herbicide, such as paraquat or glyphosate, which has little or no residual action, to kill off emerged weeds; and
- planting the crop without reworking the seedbed.

In soils that crust severely, the stale seedbed method is often not feasible. However, with soils in good tilth, modern seeders work satisfactorily, even if rain falls after soil preparation and before seeding.

### **Herbicide carryover and soil residuals**

Several herbicides can be excessively persistent even when used at label-approved rates. Atrazine, diphenamid, metribuzin and trifluralin are examples of chemicals which have a long residual effect and may affect susceptible crops grown later in the rotation. In intensive vegetable production it is safer to avoid the use of such chemicals. Even for those herbicides where the normal carry-over effect is only three months or so, deep mouldboard ploughing before planting the succeeding crop is recommended.