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Circular 892

# Controlling QUACKGRASS in Illinois

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**QUACKGRASS** is the most troublesome perennial grass on many farms in northern Illinois. It is usually found growing in scattered patches. Solid infestations are less common than in the neighboring states of Wisconsin, Minnesota, and Michigan.

### HOW TO IDENTIFY QUACKGRASS

Quackgrass (*Agropyron repens* L.) is a perennial grass that spreads by seeds and underground stems (rhizomes) which grow laterally in the soil. Quackgrass leaves are about  $\frac{1}{4}$  inch wide with a constriction that resembles an M or W about three-fourths of the way up the blade. The leaves are somewhat hairy on the upper surface, and at the base there is a pair of claw-like "hooks" called auricles which clasp the stem.

The rhizomes of quackgrass are white when young and have very sharp points which can easily spread through the soil. Rhizomes have been found penetrating potatoes and wood in the soil. The rhizomes become straw colored, are about  $\frac{1}{8}$  inch in diameter, and are smooth and hollow except at the joints where they are solid and covered with leaf-like scales. True roots and new plants form at the nodes enabling quackgrass to spread rapidly, forming a dense sod. The rhizomes are commonly found in the upper 6 inches of the soil.



New quackgrass shoots arise from rhizomes growing laterally beneath the soil surface.



A field of corn in which quackgrass is not controlled.

### **EFFECT OF QUACKGRASS ON YIELDS**

Research at the University of Illinois Northern Illinois Research Center indicates that quackgrass can seriously compete with crops and reduce yields of corn, soybeans, and small grain as well as hay and pasture crops. Experimental plots in which quackgrass was controlled yielded 80 bushels of corn and 52 bushels of oats per acre, as contrasted with yields of 15 bushels of corn and 20 bushels of oats per acre in uncontrolled areas.

In addition to competition for nutrients and moisture, quackgrass produces toxic substances which may depress the growth of crops.

### **HOW DOES QUACKGRASS SPREAD?**

Quackgrass seed may be spread in seed, hay, manure, in mud from vehicles, or on the feet of animals. Spreading of rhizomes through a field on tillage implements can turn patches into solid infestations. Unless machinery is cleaned before being moved from infested to clean fields, both seeds and rhizomes can serve as sources of new infestations.

### **CULTURAL CONTROL**

For many years cultivation was the primary means of controlling quackgrass. Cultivation was used after grain harvest, or the field fallowed during

the entire growing season. The aim was to destroy the top growth and rhizomes. This was done by starving the plant to reduce the food reserves, drying the rhizomes and top growth, and exposing the rhizomes to freezing.

### **Starving the plant**

Food reserves are stored in the rhizomes. New shoot growth in the spring or following cultivation uses the food reserves. By continually cutting the new shoot growth with tillage, the stored food is used up and the rhizomes die. A disk or cultivator with sharp sweeps has been used to shear off new growth, but the operation must be repeated each time that new plants are 2 to 3 inches tall.

### **Drying**

Quackgrass can be killed by cultivation with a field cultivator. This brings the rhizomes to the surface where exposure to sun and air can kill them. However, even with repeated cultivations, it is difficult to expose and kill all of the rhizomes.

### **Freezing**

The dry cold air of winter with temperatures lower than 20° F. can kill exposed rhizomes. But it is difficult to expose all of the rhizomes, and quackgrass protected by the insulation of the soil or snow can survive.

### **Control in pasture or hay fields**

Grazing or using the field for hay for two or three years before other control measures are used can weaken the rhizomes and cause them to concentrate in the top 3 or 4 inches of the soil. This will help make other controls more effective.

## **CHEMICAL CONTROL**

Complete elimination of quackgrass is almost impossible with cultivation alone. Besides being time-consuming and costly, a crop cannot be raised if thorough cultivation is to be used during the entire growing season. Hilly land that is fallowed is sub-



**Quackgrass controlled with 5 pounds of Atrazine 80W.**

ject to erosion. And too few cultivations may actually rejuvenate the rhizomes, cause them to penetrate the soil more deeply, and become better established.

Fortunately herbicides are now available which can give very effective and economical control of quackgrass. Methods developed for using these herbicides make control possible while raising a profitable crop.

Three of the most effective herbicides are atrazine, amitrole-T, and dalapon. Atrazine is an 80 percent wettable powder sold under the trade name Atrazine 80W. Amitrole-T is a liquid formulation of amitrole plus ammonium thiocyanate, sold under the trade names Amitrol-T and Cytrol. Dalapon, sold as Dowpon, is formulated as an 85 percent sodium salt (74 percent acid equivalent) that is dissolved in water for application.

#### **Atrazine for quackgrass control in corn**

Atrazine is a selective herbicide. Corn has very good tolerance to it while quackgrass is quite sensitive. It is absorbed by both leaves and roots of quackgrass and disrupts the manufacture of food inside the plant. As the food reserves in the plant are used up, the quackgrass dies. Corn also absorbs

atrazine, but contains a substance that deactivates the atrazine.

Where corn is to be grown for two successive years, 5 pounds of Atrazine 80W per acre may be applied prior to raising the first crop of corn. Atrazine may be applied as a single treatment or as a split application. The application can be made to quack in corn stubble or soybean stubble or on infested land that is being taken out of hay, pasture, conservation reserve, or diverted acres and is to be planted to corn. It should not be made if crops other than corn are to be planted the following year.

The **single application** of 5 pounds Atrazine 80W should be applied in 20 to 40 gallons of water per acre to actively growing quackgrass in either fall or spring.

For fall application, apply to actively growing quack, allowing at least 3 weeks before freezing weather. If preferred, the 5 pounds of Atrazine 80W may be applied in the spring when quackgrass resumes active growth, but at least 3 weeks before plowing.

The fall application has generally given a little better control of quackgrass than the spring treatment. And applying in the fall allows more time for decomposition of the atrazine.

For the **split application**, 2½ pounds of Atrazine 80W per acre is applied in the spring and another 2½ pounds of Atrazine 80W per acre is applied as a broadcast preemergence treatment at planting time. Quack control from the split application has been nearly as good as from the single fall application and offers the additional advantage of controlling annual weeds in the corn.

### **Precautions when using atrazine**

The 5 pounds of Atrazine 80W per acre indicated here is for relatively fine textured soils such as silt loams and clay loams high in organic matter. For sandy and sandy loam soils the rate should be reduced in accordance with label specifications.

Five pounds of Atrazine 80W per acre (4 pounds active ingredient) is a relatively high amount. Fortunately both corn and quackgrass help to decompose atrazine. But if rates are exceeded, or for some other reason excessive amounts of atrazine remain in the soil, crops other than corn may be damaged.

Where quackgrass is only in patches rather than in uniform stands over the entire field, treat only the patches. Do not spray areas with such a high rate where there is no quackgrass to aid decomposition.

Be sure the sprayer is working properly, agitating the wettable powder well in the tank, and applying it uniformly on the field at the proper rate. Don't overdose by lapping or covering the same area more than once. Shut off the sprayer before stopping or turning. Maintain the proper speed. Speeding up or slowing down on hills can cause a variation in rate.

When atrazine is used for quackgrass control, a second crop of corn should be raised with no additional atrazine. This allows more complete breakdown of atrazine in the soil and helps to avoid damage to sensitive crops in subsequent seasons.

### **Atrazine with amitrole-T**

Where it is preferable to use lower amounts of atrazine, amitrole-T may be applied to actively growing quack in the spring. Use 1 gallon of Amitrol-T or Cytrol in 20 to 30 gallons of water per acre. The area should be plowed 10 to 14 days later, after the quackgrass has turned white. The seedbed is prepared and corn planted as soon as possible. When corn is planted,  $3\frac{3}{4}$  pounds of Atrazine 80W per acre is broadcast to give additional quack control and also to control annual weeds. On soils low in organic matter,  $2\frac{1}{2}$  pounds of Atrazine 80W may be sufficient.

Although quack control with this combination of amitrole-T and atrazine has not always been as good as from the 5 pounds of Atrazine 80W alone, it has sometimes been quite effective. The combina-

tion does allow use of less atrazine, and if the stand of quackgrass is sufficiently dense to aid in decomposition of the atrazine, it may be possible with this combination to raise oats or soybeans the next year if there is some good reason for not raising corn.

### **Dowpon for other crops**

When a crop other than corn, such as soybeans, is to be raised, Dowpon (dalapon) may be used for control of quackgrass. It can also be used prior to planting corn, but has not generally given as complete control as atrazine.

For fall treatment, 10 pounds of Dowpon may be applied in 30 to 40 gallons of water per acre when quackgrass is actively growing during late September or early October. The treated area can be plowed 10 to 20 days after treatment, or plowing can be delayed until spring.

If spring treatment is preferred rather than fall treatment, 6 to 8 pounds of Dowpon in 30 to 40 gallons of water per acre can be applied in the spring when quackgrass is about 6 inches tall and growing well. After spraying, wait 7 to 10 days before plowing and another 3 to 4 weeks before planting a crop.

There is little danger that Dowpon will carry over in the soil when applied in the early fall. But spring applications may damage the crop unless there are at least 4 to 5 weeks of warm, moist weather between application and planting.

This circular was prepared by Ellery Knake, Associate Professor of Weed Extension, and Fred Slife, Professor of Crop Production.

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