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A PRELIMINARY REPORT ON
EXPERIMENTS TO CONTROL QUACKGRASS

by

V. H. Freed and H. E. Bierman

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 by

V. H. Freed¹ and H. E. Bierman²

Introduction

The control of quackgrass has proved to be one of the most difficult agricultural problems. In general, weed chemicals have proved to be less effective on this plant than on most weeds. In view of the current publicity on a number of new chemical materials and the widespread interest in them, it appears desirable to report on the experimental work in Oregon on quackgrass control. Some of the work has been in progress long enough to permit definite recommendations but the investigations on new materials will not permit more than a discussion of methods and some general observations.

Description

Quackgrass, (Agropyron repens), also known as couch grass or sometimes erroneously called Johnson grass, is a perennial weedy-grass very troublesome in cultivated areas. This grass is a rather broad-leafed grass which grows to a height of 18 inches or more, depending upon the fertility and general growing conditions, and which develops a number of creeping underground stems called rhizomes. These rhizomes are about the diameter of baling wire and may be from two inches to a foot or more in length. They are whitish to yellowish in color when in a healthy growing condition.

The quackgrass spreads from one area to another in a field, or from one farm to another by means of both seed and the rhizomes. A rhizome when cut into small pieces establishes new plants. From each joint on the rhizome the quackgrass sends out two roots and a new plant. Several methods of controlling this plant have been studied. The various methods used in an attempt to control this plant include cultivation and a number of chemicals.

Cultural Control

The cultural control of quackgrass is accomplished by working the land early in the spring, preferably in April or very early May. However, good results can be obtained by plowing immediately following the harvest of a fall-planted

¹Associate in Farm Crops & Agricultural Chemistry Dept.

²Research Assistant, Farm Crops

crop. If the land is plowed, the furrow slice should be turned on edge rather than completely over. After the land has been allowed to dry out thoroughly the cultivation is started. Disking of quackgrass is definitely not recommended, although there have been some reports of controlling the plant with this implement. Cultivators, having a harrow-like action, that bring the roots to the surface are recommended. The first cultivation is done at right angles to the direction of plowing. After permitting the roots brought to the surface to dry for a few days, they should be raked off and burned when thoroughly dry. At intervals of 6 to 8 days throughout the summer the quackgrass should be cultivated. After cultivation it is recommended that the roots be raked, piled and burned. If the area infested with quackgrass is very small it may be dug out by hand using a potato fork, or a manure fork, and the roots burned after drying.

Cover Crop Helpful - In the fall a cover crop such as rye should be sown. If necessary a nitrogen fertilizer to stimulate a vigorous cover crop growth may be used. The fall cover crop should be sown at one and one-half to twice the normal rate of seeding. A second season cultivation may be necessary to eradicate the plant completely.

Rototilling at frequent intervals has shown promise of controlling quackgrass.

Sodium Chlorate - Sodium chlorate has often been successfully employed for the control of quackgrass. This chemical gives a sterility of the soil for periods ranging from one to five years, depending on the amount of rainfall and the fertility of the land. Sodium chlorate should, therefore, be used only on rather limited areas where it is not desired to crop immediately. The sodium chlorate may be applied dry in the spring or in the fall, or as a spray during the summer. The application should be split to apply two pounds per square rod sodium chlorate at one time and two pounds per square rod about a month later. This makes a total of four pounds per square rod.

Soil Fumigants - Prochlor, a soil fumigant, has been found to be one of the most effective materials for the control of quackgrass on small areas. Soil fumigation, while laborious and expensive, is none the less the most satisfactory method of controlling quackgrass in garden patches and other limited areas.

The Prochlor should be injected into the soil at intervals of nine to twelve inches to a depth of two to three inches. The rows of injections should be staggered to give a checkerboard effect. The reader is referred to Station Circular of Information 403 for additional information.

Prochlor is toxic to all types of vegetation, hence due care must be exercised when using it around desirable plants.

Oils - Various oil weed killers such as Shell 20, Standard No. 2, and Avon Weed Killer show promise when applied repeatedly to growing quackgrass. Such materials might safely be used around berry plants, in orchards, etc., if due precautions are taken not to treat the crop plants with the oil. The first application should be made at the rate of about 160 gallons of oil weed killer per acre followed by applications of 80 gallons of oil weed killer per acre as the quackgrass makes regrowth.

New Chemicals - Several new chemicals are currently being tested for their ability to control quackgrass. As yet, these chemicals are not ready to be recommended for field use since a great deal must yet be learned about them. However, a great deal of interest has been expressed on the work being done with the new chemicals. Consequently, a brief discussion of them follows.

I.P.C. - I.P.C. (also INPC and IPPC) is the abbreviated name of a chemical O-isopropyl-N-phenyl carbamate. This chemical exhibits an unusual property in that it appears to inhibit the growth of grassy plants. Certain broad-leaf crops appear to be injured by it, but I.P.C. seems to be very specific for grass. It is a grayish-white crystalline powder very insoluble in water and slightly soluble in oils, alcohol and other organic solvents. It is not translocated in the plant as are certain other chemicals, hence it is necessary to bring this chemical into intimate contact with the growing plant in order to kill it.

The most successful treatment for the control of quackgrass with I.P.C. to date has been by dissolving the I.P.C. in oil. The I.P.C. is dissolved in 80 to 100 gallons of weed oil and used at a rate to give 80 gallons of oil and 10 pounds of I.P.C. per acre sprayed. This application is made when the quackgrass is 8 to 12 inches high. After a period of a week or ten days the vegetative material is disked or thoroughly worked into the soil. The land is permitted to lie idle for several months, and during the course of this time the quackgrass dies. After the elapse of several months the land may be brought back into production.

T.C.A. - T.C.A. is the abbreviated name of the salt of trichloro-acetic acid. This is a new material being investigated as a chemical agent for the control of weedy grasses. It is a water soluble salt varying from white to a rather light brown in appearance. T.C.A. should be handled with extreme caution because of its burning effect on tissue. If any of the liquid is splashed on the skin or in the eyes it should be washed out thoroughly and immediately.

T.C.A. is applied as a water spray at the rate of about 240 to 300 pounds per acre for the control of quackgrass and other perennial grasses. The material causes a sterility lasting upward of 3 months under normal conditions of rainfall during the summer months.

T.C.A. like I.P.C. is showing some promise as a selective herbicide for killing weedy grasses out of certain other crops. T.C.A., however, is not as specific as I.P.C. and very often crops such as vegetables are injured by the treatment.

Caution - It should be kept in mind that the foregoing information is still of a preliminary nature and that a great deal of experimental work is necessary before the final recommendation on either I.P.C. or T.C.A. can be made for control of weedy grasses.