Wild Garlic

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Wild garlic (Allium vineale) is a troublesome weed in small grains and pastures because of the "garlicky" flavor it gives to grain and to beef and dairy products when animals graze on garlic-infested pastures. Wild onion (Allium canadense) also may cause flavors in grain and animal products, but it is easier to control. Unlike wild onion, wild garlic has hard-shell bulbs that may remain dormant for four to five years; thus, even if wild garlic plants are killed, new plants will come up from hard-shell bulbs.

Wild garlic has round, hollow stems and has underground bulbs with hard, angular shells. Wild onion has flat stems that are not hollow, and all underground bulbs have soft shells.

Wild garlic plants growing from small bulbs usually do not produce scapes (heads) during the first year. When growing under stress from repeated tillage or mowing, wild garlic plants usually put up only leaves and no scapes. The bulb from which the leaves emerge remains in the soil when the leaves die in the summer and will grow again in September. This central bulb usually produces hard-shell bulbs each season.

Under good growing conditions, the wild garlic bulb elongates and produces leaves and a scape with aerial bulblets. Then the plant produces a large, soft bulb (soft offset) to the side of the main stem along with a number of hard-shell bulbs. Both wild garlic and wild onion produce aerial bulblets that may be troublesome in wheat.

Wild garlic is a serious economic problem in Missouri's winter wheat crop. The aerial bulblets, which mature along with the crop, shatter readily and are harvested with the wheat. About the same size and weight as a grain of wheat (Fig. IV), bulblets are difficult to separate from the grain even with the best of cleaning equipment. Even when bulblets are removed, a "garlicky" odor may remain in the wheat. When marketed, wheat is graded "garlicky" if two or more bulblets are present in 1000 grams of wheat (about 1 quart). Such wheat is "docked" in price, sometimes as much as $2.00/bushel, which can result in serious financial loss to the grower. Some grain buyers refuse to accept "garlicky" wheat.

Even a few garlic bulblets ground with the wheat can spoil flour. Also, when grinding the grain, a moist sticky coating forms on the mill rollers, which makes stopping the mill necessary to clean the machinery.

Wild garlic also presents a major problem in pastures grazed by dairy or beef animals. Milk, butter, cheese and even meat can become tainted and unpalatable when wild garlic has been grazed.

Farmers may profit by storing garlicy wheat separately. Garlic bulblets are high in moisture content at harvest, but in storage they dry and become chalky. In this condition, they can be removed with a fanning mill. A six-month period in storage is usually considered adequate for effective cleaning. Artificial drying facili-
ties speed up the process, especially under humid conditions.

Feeding garlicky wheat to hogs or chickens may be more profitable than taking a market discount. If fed, grind or crush the mixture, so garlic bulblets will not sprout and infest the feeding area. Wild garlic infestations around poultry operations often result from manure and spilled feed.

The rapid increase in garlic infestations may be caused in part by earlier fall seeding. With the development of Hessian fly-resistant wheats, farmers often seed wheat in September. Since wild garlic begins to grow in early September, scapes have time to develop and produce aerial bulblets to infest the harvested grain. However, late seeding after plowing or other tillage will delay emergence or reduce growth of the garlic, and fewer scapes will develop to produce aerial bulblets.

Seedbeds for wheat are usually prepared by disk ing without previous plowing. This practice leaves garlic bulbs near the soil surface, where they will sprout, grow rapidly and develop into plants producing aerial bulblets.

Application of 2,4-D in the fall causes injury to fall-planted small grain. However, application of 2,4-D in the spring after the grain has tillered but before rapid elongation or jointing of the stems occurs seldom causes significant injury to small grains.

A more recent and more successful method of chemical control includes an application of paraquat at a rate of 1 lb./acre applied in early April. In a five-year study at Columbia, paraquat, applied once a year, eradicated wild garlic from a field continuously cropped to soybeans. In the experiment, tillage consisted of seedbed preparation by disk ing followed by cultivation as needed.

Finally, a third method of chemical control includes the use of atrazine over a four to five year period. On experiment fields, atrazine at 5 lbs./acre was incorporated in September or October. No plants emerged in treated areas in the fall or following spring. Presumably, annual application of atrazine would be necessary to kill plants originating from hard-shelled bulbs, which sprout during subsequent years. Since atrazine residues remain in the soil for varying periods of time, rates could be reduced after the first year of application. Obviously, in such a program, atrazine-tolerant crops would have to be grown. Spring incorporation of atrazine does not successfully control garlic.

**Chemical Control in Pastures**

Several herbicides, at rates tolerated by pasture plants, will control or suppress wild garlic.

Either 2,4-D or 2,4-DB applied at 1 to 2 lbs./acre two times a year will control wild garlic. Treatments made in November or early December and repeated in February or March are usually more effective than treatments applied on other schedules. Neither chemical provides good control if top growth of the wild garlic has been recently mowed or grazed. Also, mowing or grazing during the first week after treatment may decrease the effectiveness.

**Chemical Control**

When wild garlic is present in wheat, 2,4-D at ½ to ¾ lb./acre or a mixture of 2,4-D with ½ lb. dicamba (Banvel) is recommended.

The ester form of 2,4-D has been more effective than the amine, perhaps because the esters penetrate the wax on wild garlic leaves better than the amines.

These rates are too low to kill wild garlic, but the application causes stems bearing the aerial bulblets to droop and bend over, so the combine can cut wheat above the aerial bulblets. However, garlic plants sometimes recover from the herbicide application, so then the aerial bulblets are harvested with the wheat. Results obtained with these herbicides frequently have been unsatisfactory because application may not control wild garlic and may cause injury to wheat.

**Figure 3. Aerial bulblets are pictured on the left, bulblets with flowers on the right.**
Figure 4. Wheat grains and aerial bulbets are similar in size and weight.

Four to five years of treatment is necessary for satisfactory control. Because hard-shell bulbs may continue to sprout for as long as five years, annual treatments would be necessary for eradication. Wild garlic is controlled more effectively by 2,4-D than by 2,4-DB, but 2,4-DB is not as likely to kill desirable pasture legumes. Most established grasses will tolerate treatment with either of these two herbicides at 1 to 2 lbs./acre, but either herbicide may kill or injure seedling grasses.

Cultural Control

Deep plowing may be an effective means of eradicating wild garlic; however, results have not been entirely satisfactory. Plowing at the wrong time followed by other tillage might bring garlic plants back to the soil surface. Research at the University of Missouri over a five-year period shows that if wild garlic plants are buried at depths of 6-8 inches in mid-October or early April, less than 5% of the plants will emerge. Thus, research indicates that deep plowing (up to 12 inches) to bury the entire wild garlic plant should be effective, providing that subsequent tillage does not return it to the surface.

Plowing in September or May was not effective. In mid-October or early spring garlic plants have grown at the expense of food reserves in underground bulbs and when buried at that stage no longer have adequate food reserves that will enable them to emerge.

Subsequent tillage should be shallow, so as not to bring hard-shell bulbs near the surface. Hard-shell bulbs are small, and if they sprout deep in the soil, they do not contain sufficient food reserves to emerge. Hard-shelled bulbs often remain dormant for four to five years, therefore, they should remain buried for at least that length of time.

Mowing reduces the size of garlic plants and the weight of their underground parts. Close cutting causes more injury to garlic than high cutting, and mowing in April is more effective than mowing in June. Mowing is not effective in irradiation and even when frequently mowed in lawns it persists.

A vigorous, uniform stand of wheat competes well with wild garlic, so the use of high quality seed in combination with a sound fertility program will insure a good stand.