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# PERENNIAL PEPPERGRASS

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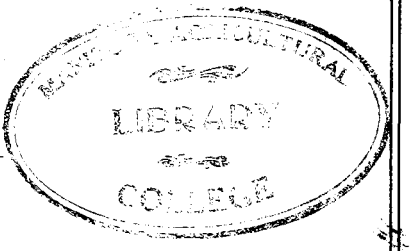
BY

A. K. PEITERSEN and R. T. BURDICK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# PERENNIAL PEPPERGRASS

## A Noxious Weed in Colorado

*By* A. K. Peitersen *and* R. T. Burdick

**I. Introduction**—Recently the perennial peppergrass has become of such frequent occurrence in Colorado that unless prompt action be taken for its control it is almost certain to spread itself over most of the cultivated areas of the state. During the past season this station has received numerous urgent appeals for some definite advice concerning methods for controlling this pest. These appeals have come from widely different sections within the state. It was therefore thought that a preliminary report on this noxious weed might be timely in acquainting the farmers of the state with the characters of this introduced plant and in this way its introduction into uninfested areas might be prevented. Preventing its introduction into new fields is far easier than prescribing methods for its eradication when once established.

**II. Name and Description**—The perennial peppergrass is botanically known as Lepidium draba L. but in common with other plants which are of economical importance or which have attracted the attention of the passer-by it is recognized by a number of common names such as: Perennial Peppergrass, Hoary Cress, Turkestan Mustard, White Weed, and a number of other local names which are generally descriptive of the plant. In the San Luis Valley it is commonly referred to as the Perennial Peppergrass, while in the Grand Valley it is more frequently called White Weed. The former name, however, is used most generally throughout the United States.

This plant is an erect perennial, ten to twenty inches high, having a much-branched inflorescence, spreading profusely by underground root stocks. Its leaves are oblong or lanceolate, obtuse and slightly toothed, 1½ to 3 inches long, whitish-pubescent, the upper sessile and clasping the stems, the lower long and petioled. Inflorescence consisting of white, showy flowers; pedicels long; the 2-carpellate pistil ripening into a flattened fruit having a slender style about ⅛ inch long; pods somewhat heart-shaped and wingless, usually containing one mature seed; seeds dark brown, somewhat tapering at one end and about the size of alfalfa seed. (See Plate I.)


Plate I—Perennial Peppergrass (Lepidium draba L.) two-fifths natural size.

**III. Other Related Plants**—The Perennial Peppergrass is a member of the mustard family and is a very close relative of the common field peppergrass (Lepidium apetalum L.) It is often confused with the less common species of this genus; especially Lepidium jonesii Rydb. and Lepidium scopulorum Jones which are also quite abundant upon the Western Slope and in the San Luis district. These resemble it somewhat in general appearance; especially in their showy inflorescence. However, anyone who has had field experience with this plant has no difficulty in distinguishing it from either of these. Its characteristic spreading growth due to underground root stocks, its broad, whitish-pubescent leaves, the upper ones clasping the stem, its wingless pod bearing, a long slender style, and its large brown seeds are distinguishing characters of this plant.

**IV. Its Introduction and Distribution**—Lepidium draba L. is a native of central Europe and western Asia but is now quite common throughout continental Europe and the British Isles. Its first appearance in this country was noted about the seaports of New York, Washington and elsewhere which would seem to indicate that it has been carried into the United States on ballast or ship refuse. However, its almost simultaneous appearance in Colorado, Wyoming, and New Mexico suggests that it has also been carried into this country in foreign grown seed; possibly alfalfa seed.

At present its distribution in the United States is quite general in local and restricted areas. It has been reported from most of the eastern coastal states and a few of the central states such as: Michigan, Wisconsin and Iowa. On the western coast, especially in California, it is becoming a serious pest. However, in no localities in the United States does it seem to be as pernicious as in the Rocky Mountain region at altitudes from 4,000 to 8,000 feet. In Wyoming, Idaho, Colorado and New Mexico it is already a serious pest in many districts.

It made its appearance in Colorado some twenty years ago. Its presence in this state was first noted by C. S. Crandall who collected specimens of this plant in 1898, growing in the vicinity of Palisade. From there it has spread until now it is established in local areas in most of the irrigated land of the state. Plate II shows its present distribution in Colorado. The shaded portions of this map indicate the parts of the state where this plant is found growing, but only in very restricted areas and sometimes only a few plants at a station. It is especially troublesome in the Grand Valley and the San

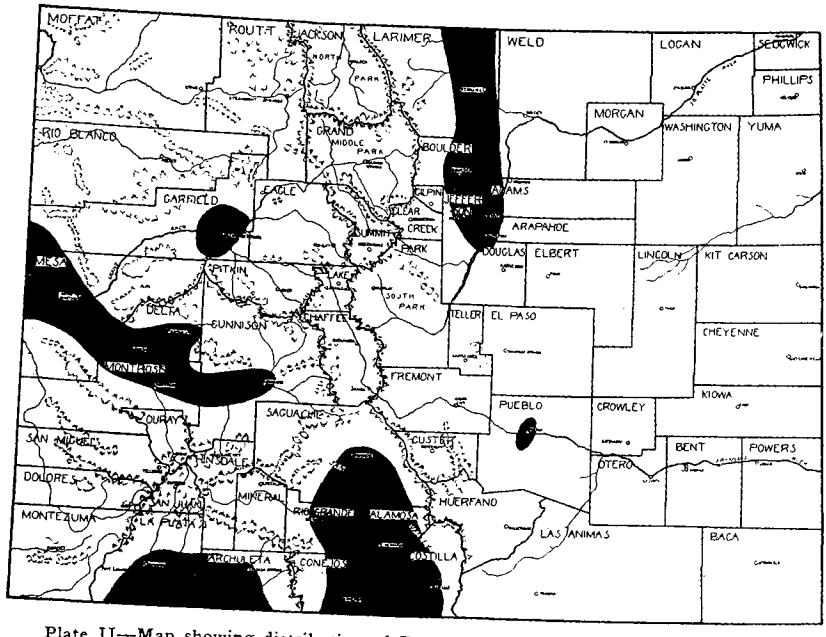


Plate II—Map showing distribution of Perennial Peppergrass in Colorado. Shaded areas indicate localities from which it has been reported.

Luis Valley where in many instances entire alfalfa fields have been invaded.

**V. Methods of Dissemination**—Considering the habits of this plant it is almost certain that in time it will spread over most of the state unless effective control measures are used. Its large, white, perennial, underground root stock, which in some instances penetrates the soil several feet and spreads horizontally in all directions, enables it to spread out from year to year. The writers have seen patches in alfalfa fields which have been invaded by this weed where the alfalfa plants have been completely crowded out and a hundred per cent stand of this pernicious pest has taken its place. Not only does it spread over fields in this way where it has gained a foothold but it is quite frequently introduced into new localities by the dissemination of its seeds in foul alfalfa. The size of the seed is quite similar to that of alfalfa and unless purity tests have been made of such seed it is very apt to escape the attention of the purchaser. The Colorado Seed Laboratory received, during the past year, nine lots of alfalfa and sweet clover seeds which contained this impurity. Eight of these samples were native grown.

**VI. Methods of Eradication and Control**—Perennial Peppergrass belongs to a class of plants which is most difficult to eradicate from the soil. As has already been noted the plant has well developed root stocks which are able to penetrate the soil for several feet in a horizontal direction from the original plant. During the season's growth these root stocks store up food which is used during the next year to send out new shoots from the joints of the root stocks and these new shoots develop into new plants. Before the plant can be killed the root stocks must be removed from the soil or killed in some other manner. This is a difficult proposition. Starvation of the root stocks by allowing them to send out new shoots which are cut off as fast as they develop will finally kill them. This is much easier said than done as the food stored up in the root stock is sufficient to send up a dozen or more shoots before it is exhausted. A farmer will successfully cut off the first two or three shoots but by the end of that time his faith in the method of control will weaken and he will neglect further cultivation. The next shoot will grow and store up new food in the root stock. As a result of his omission to kill the third or fourth plant the weed will return to its first vigorous condition.

A method of control of this weed to be effective must be one that is easily applied, that fits in with regular farm work and is not too expensive. It is difficult to find any one method that meets these conditions. Prevention is far more effective than cure in this case but unfortunately many farmers are not in a position where they can successfully prevent the weed from becoming a pest on their farms. At the present time it is being distributed with alfalfa or sweet clover seed. Farmers should refuse to buy and sow any alfalfa or sweet clover seed when the analysis of the State Seed Laboratory indicates the presence of perennial peppergrass seed. Once the weed is established it will require the most persistent efforts of farmers who are awake to the seriousness of this pest to completely eradicate it as one individual plant which escapes them is able to re-seed the field.

Following are some methods which have been tried in controlling this weed:

**First**—Eradication by clean cultivation. This means what has been outlined above, namely keeping the ground absolutely free from any of the plants. To do this it will be necessary to thoroughly disc or cultivate the field at least once a week and sometimes twice in the growing season so that at no time will the plant have a chance

to keep a leaf growth above the ground. One year of thorough treatment of this type should so weaken the plant that the second year a cultivated crop such as potatoes, sunflowers, or corn could be grown and given thorough clean cultivation, with special care that no perennial peppergrass plants are allowed to grow. The objections to this method are that it sacrifices one year's use of the land and that it requires constant attention and thorough cultivation regardless of other farm work. This practically means that the method will never be successfully used except in individual cases. It is, however, when used, a most reliable method.

**Second**—A method which has been suggested is to plow the field, fence it, and turn in some hogs with noses in working condition. If enough hogs are used they will dig up the patch and eat the majority of the root stalks. The pasture should be watched and, if

Plate III—An expensive but sure method of eradication.

necessary, either re-plowed or hand hoed. This method will prove effective and eliminate perennial peppergrass in small areas.

**Third**—Another method is to fence off the patch and turn in sheep, which eat it very readily. They will crop the weed close to the ground and eventually exhaust its vitality. This is not as effective as the hogs and is of doubtful value but it will prevent the weeds from forming seeds and in that way check somewhat the spread.

**Fourth**—The weed, when in small patches, can be killed by completely covering the ground with some material that shuts out the light and prevents the plant from growing through it. Plate III shows this method as used by Mr. Luther Norland of Sanford.

Mr. Norland put roofing over the infested spots and extended it out two feet beyond the weed in all directions. He found it necessary to lap the roofing and nail it to 1x2 inch strips of lumber in order to prevent the weeds from forcing their way between the strips of roofing. This method will require that the patch be fenced off so that livestock will not walk over the roofing and make holes through it, and it is recommended that the field be left covered for two years. Care should be exercised in extending the roofing at least two feet in all directions beyond any visible signs of the plant as it is able to force its way a considerable distance horizontally. This method is expensive in first cost but if properly protected the same roofing can be used later in another place. This is probably the most effective cover that we have seen in use. Almost any other material which can be used would not prevent the shoots from coming up to the surface through some crack or crevice.

In addition to the above methods chemical sprays have been used effectively in combating many of our worst weeds. Plants of the mustard family are especially susceptible to chemical treatments. Although no spraying experiments have as yet been carried out with this species, it is known that an iron sulphate spray will kill the common peppergrass. The objection to this, however, lies in the fact that the spray kills only that part of the plant above the ground. Consequently one spraying is no more effective than one cultivation and to make it effective it would be necessary to spray the patch several times during the season.

If salt is used as a control measure a sufficient quantity must be spread over the soil to make it strongly akaline. This will not only kill the peppergrass but will also destroy all other vegetation. If

this is done, however, the salt can be removed from the soil by flooding and proper drainage during a few seasons.

All the above suggested methods of eradication apply to the plants already established in the soil. Generally peppergrass seed in the soil will not retain its vitality for more than two seasons. Seed, therefor, which is already in the soil, would be destroyed by the above treatments, especially clean cultivation, smothering, or the salt treatment.

As has been noted previously, it is far easier to prevent its introduction than to eradicate the plant when once established, and it is the purpose of this report to impress upon farmers the necessity of combating this weed before it becomes a serious and widely disseminated pest.