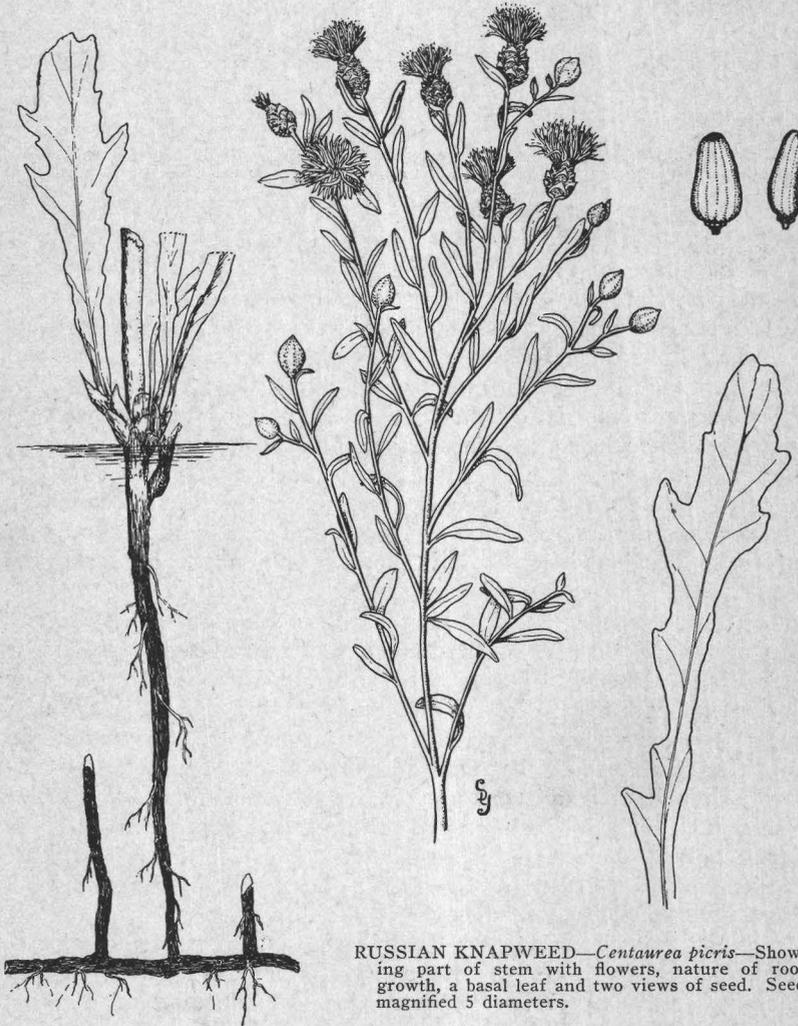


Russian Knapweed

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RUSSIAN KNAPWEED—*Centaurea picris*—Showing part of stem with flowers, nature of root growth, a basal leaf and two views of seed. Seed magnified 5 diameters.

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Russian Knapweed

(*Centaurea picris*)

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Illustrations by Cathrine Davis Young

Other names: Turkestan thistle, Blackroot.

RUSSIAN KNAPWEED is a comparatively new weed to Oregon. It is reported to occupy 400 acres in the state. It is one of several "knapweeds" so named because of heavy gray hair or nap on the stems. This weed apparently will live in any county in Oregon, but as the seed is usually carried in with alfalfa seed, most of the present infestations are in alfalfa-growing regions of Eastern Oregon. It spreads by underground roots and seed.

Leaves on mature stems are small and narrow with unbroken edges. Ends of leaf blades are narrowed, with small sharpish tips. Leaves and stems are covered with short, stiff, sticky hairs that are irritating to the skin. Leaves at base of plant are large and similar to dandelion leaves, but those toward the top of the stem are smaller.

The rootstock of this weed is dark brown or black, woody and scaly. It is therefore sometimes called "blackroot," and these woody, dark rootstalks provide the easiest identification of the plant. The roots penetrate downward many feet, and a few inches from the surface send out lateral rootstocks that form new plants at frequent intervals. Portions of roots, if broken off, may grow and form new plants.

Young stems of Russian knapweed are covered with soft gray nap, not usually present on the branches. Stems normally grow 3 or 4 feet high. The plant has very little forage value, either green or dry. It appears to be distasteful to animals and the stems are stiff and woody even when young. The mature stems are hard and harsh.

The flowers somewhat resemble those of common bachelor button or French pink, and are borne on rather long, leafy stems. Flower heads are from $\frac{3}{8}$ to $\frac{1}{2}$ inch in diameter and range in color from lavender to white and are usually almost round. Absence of thorns, size of the heads, and the way the flowers are borne distinguish this weed from most of the true thistles.

Seeds of Russian knapweed are light gray, almost straw-colored, and shine like fresh, clean wheat straw. Sometimes they are slightly curved, but are generally symmetrical—flattened, one end pointed, and the other rounded. Although the seed is slightly larger than alfalfa it is rather difficult to clean from it and also from red and sweet clover. Seeds have short, rather stiff hairs, which usually break off in threshing or handling.

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Damage

Russian knapweed ordinarily grows in very dense patches, so thick that they are difficult to walk through. They completely occupy the ground, and no crop will grow among them. They also spread and enlarge their patches in alfalfa or even in bluegrass sod, although spread is more rapid in cultivated land. Hogs seem to like the heavy roots, but no other animals get much of value from the plant at any stage except very early in the spring.

Oregon Seed Law

Seed containing *any* seeds of Russian knapweed may not legally be offered for sale in Oregon.

Control by cultivation

For large areas, continuous cultivation seems to be the most satisfactory control method. It may require from 15 to 20 cultivations the first season. The weed is not ordinarily killed in one year but the work and expense the second year are greatly reduced. One must start early and work the ground about once a week all summer. A rod weeder, blade, or duckfoot will be satisfactory. The black roots are so numerous that in the beginning of the work a blade weeder may require too much dumping to be practical. Continuous cultivation is dangerous in a blow area. Where it is necessary to cultivate the weed in blow soil, the best procedure is to cultivate strips or small fields, seed them to grass or alfalfa, then continue the work on other strips.

Recent work in other states indicates that control of some weeds by cultivation may be just as efficient if each cultivation is delayed for a week to ten days after the weeds appear. This system has not been tried on knapweed, but it would probably be effective.

In all of the lower-elevation, long-season sections of Oregon the deferred fallow system would probably work as well as season-long cultivation, and it costs only a third as much. With this method, seed a fall crop at about twice the usual rate, cut early for hay, then plow and work the ground, keeping all growth below the surface. In the fall seed another crop and repeat the operation.

Control by chemicals

Sodium chlorate applied either in the spray or powder form is the cheapest effective chemical at present. It should be applied on most soils at the rate of 4 pounds of chlorate to the square rod. When used in the spray form, $1\frac{1}{2}$ pounds of the chemical is dissolved in one gallon of water. If spraying is to be practiced, best results have been obtained by spraying as the weeds are approaching maturity, in the late summer or fall.

Applying the dry chlorate directly to the soil has given as satisfactory control in Oregon as spraying the foliage of the weeds. This practice has the advantage of requiring less equipment and no hauling

of water, and to a large degree eliminates the fire hazard that is present after spraying. As the chemical does not distribute itself any distance laterally through the soil, it is very important that the entire area be evenly covered. This is facilitated by mowing and raking the tops before applying the dry chlorate. Fall applications are most satisfactory in areas of about 30 inches of rainfall or less.

Chlorates are dangerous unless proper precautions are observed. These chemicals should not be used without reading and observing the precautions listed on pages 19 to 22 in Oregon Extension Bulletin 510.

Carbon bisulphide is the most effective chemical where conditions are right. Soil moisture is essential to success. It has advantages over chlorates in that it is quicker acting and the land is left unproductive for only a few weeks. This chemical is more expensive and requires more labor to apply than others. It is a liquid that is poured at the rate of 2 ounces per hole into holes that are staggered 18 inches apart and are 6 to 8 inches deep. The holes should be tamped shut after the liquid is applied. Carbon bisulphide has not proved effective on gravelly or heavy or gumbo types of soils. It is desirable to cut the plants off below their crowns and to rake and burn them before treating with carbon bisulphide. Covering the treated area with tar paper to confine the gasses in the soil or else applying a light application ($1\frac{1}{2}$ pounds to the square rod) of sodium chlorate makes success with carbon bisulphide more positive.

Other control methods

Some farmers have been able to prevent knapweed from spreading, and to a degree, to eradicate the weed by developing a good stand of alfalfa. Alfalfa undoubtedly will compete more satisfactorily with the weed than any other crop, but it is usually impossible to get a stand of alfalfa in a knapweed patch unless the land is cultivated for a year prior to seeding. This weakens the roots and gives the alfalfa a chance to get started.

If knapweed is found in one or more small patches, the weeds can be destroyed by pulling, digging, or hoeing them whenever new growth is found. Such work will require two years of unrelenting vigilance.

With any treatment be sure to *kill the last plant* or regrowth will appear and soon cover the entire area again. When chemical treatments are used, they should be applied at least five feet beyond the borders of the weed patch.

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