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Common Crupina

Biology, Management and Eradication

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Common crupina (*Crupina vulgaris* Cass.: Asteraceae) is an alien invader in North America. It forms dense populations that dominate forages on disrupted or depleted rangelands. It reduces the biodiversity of many native ecosystems where it occurs in the Pacific Northwest. Common crupina is designated noxious by federal and state laws and must be controlled.

Distribution

Common crupina is native to the Mediterranean region of Europe. It is weedy in Russia, where it is a pest of semi-arid pastures. The first report of this weed in the United States was near Grangeville, Idaho, in 1969. Since then, it has been found in California, Oregon and Washington (see maps on page 3). Common crupina currently occupies more than 50,000 acres in these four states and has the potential to spread throughout much of the Pacific Northwest and intermountain region.

If you find common crupina outside its presently known boundaries, report your finding to the agricultural Extension agent in your county.

Common crupina occurs in a wide range of habitats. The primary Pacific Northwest habitat is southern slopes in steep canyon grasslands. The weed infests sites where downy brome, wheatgrasses, fescues, lupines and arrowleaf balsamroot occur. Forested areas also can support this weed. Ponderosa pine and Douglas-fir are associated with common crupina as are oceanspray, smooth sumac and poison ivy. Common crupina has been reported rarely in annually tilled cropland but occurs along field edges and in improved pasture, hayfields, grass seed fields and Conservation Reserve Program (CRP) plantings. The weed frequently infests gravel pits, roadsides, railroad embankments and other right-of-ways.



For complete eradication instructions, this publication should be accompanied by University of Idaho Agricultural Experiment Station bulletin 701, *Eradication Manual for Common Crupina*. Order from Ag Publications Building, University of Idaho, Moscow, ID 83843.

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Spread

Wind may spread common crupina seeds up to 5 feet from the parent plant. Rodents have carried seeds up to 50 feet, and cattle and deer have carried seeds on hooves and hair at least 300 feet from the parent plant. Common crupina seeds have survived passage through the digestive systems of most animals except sheep. Livestock may transport seeds for great distances before excreting them. Recreational vehicles such as motorcycles and all-terrain vehicles also can spread seeds over long distances.

Description

Seedlings first appear aboveground as two oblong, fleshy cotyledons $\frac{1}{2}$ to 1 inch in length (Fig. 1). The prominent midvein of the cotyledons is usually purple or red. The midvein and the large, fleshy cotyledons distinguish common crupina from associated species. Rosette leaves develop above the cotyledons and progress from entire (smooth margins) to lobed to finely dissected as the plant grows (Figs. 2 and 3). Older leaves develop short, stiff spines that are prickly to the touch.

Each plant has one main flowering stem, $\frac{1}{2}$ to 3 feet tall (Fig. 4), that can branch near the top into five to 15 branches under good growing conditions. One or more flower heads appear at the end of each branch. Under poor growing conditions, or where crupina plants are very crowded, each plant produces only one to three branches with flower heads.

Flowers are lavender to purple (Fig. 5) in flower heads that are $\frac{1}{2}$ inch long. Seeds are $\frac{1}{8}$ to $\frac{1}{4}$ inch long, cone shaped and taper to a blunt point. A dense circle of $\frac{1}{4}$ -inch-long barbed hairs surrounds the wide end of the seed. Seeds are black or silvery beige (Fig. 6).

Biology and ecology

Common crupina is in the same botanical tribe (Cynareae) as the knapweeds, which include yellow starthistle, diffuse knapweed and spotted knapweed. Common crupina is a winter annual with many of the ecological habits of other winter annual knapweeds. For example, seeds usually germinate in late summer or fall after rains begin. Plants overwinter as rosettes, usually bolt in April and flower during May and June. Flowering continues as long as soil moisture is available. Each plant produces 5 to 80 seeds in summer, and about 85 percent germinate that autumn. Most seeds fall from the plant at maturity, but a few remain on the plant through the winter. Seeds that do not germinate during the first year survive in the soil for as long as 32 months.

Common crupina grows in sandy or loamy soils that are well drained and slightly acidic. The precipitation where this weed occurs is 15 to 30 inches per year, and the mean annual temperature is 46° to 54°F. Common crupina has been found at elevations between 1,000 and 3,200 feet in the Pacific Northwest.

Eradication vs. control

Tactics for dealing with weeds differ according to objective: control or eradication. In "weed control," as applied to common weeds in farmland and homesites, the weed species is expected to be suppressed, not permanently removed from the site.

Noxious weed laws of the Pacific Northwest require eradication of common crupina. "Eradication" in noxious weed laws means complete removal or destruction of a weed species, including its seeds and roots, from a defined area. There must be no possibility of the plant's reappearance unless it is reintroduced from outside the eradication zone. Biologically, common crupina eradication is feasible because of the weed's slow natural dispersal, short seed life, dependence on seed for annual regrowth, grassland habitat and susceptibility to herbicides that do not destroy grasses. Eradication of common crupina can be accomplished by practicing intensive long-term weed control.

Control methods

Mechanical

Hand pulling, hoeing or other tillage is frequently the best treatment in and adjacent to homesites, gardens, urban areas and some sensitive crops or where infestations consist of only a few plants and can be inspected frequently. Inspect the infested site every 2 to 4 weeks each spring and summer to find and treat all common crupina plants before they flower.

Biological

No insect parasites or special pathogens are available for biological control. Competitive grasses can suppress common crupina and are readily available for sites where planting is possible. Unlike obligate parasites, competitive grasses do not depend on weeds to exist, they effectively resist invasion of other weeds in addition to common crupina and they are themselves productive. The importance of healthy perennial plant communities cannot be overemphasized.

Herbicides

Control and eradication of common crupina in most currently infested sites depends mainly on use of herbicides. Read product labels to verify use is legal and to comply with safety requirements. Before you use a herbicide that does not name common crupina on its label, be sure that the label shows that the herbicide is legally approved for use on the site for which it is intended.

The following herbicide treatments are tolerated by grasses. Most include picloram because it is the most effective, long-lasting treatment due in part to its long life in soils. *Picloram is a restricted-use herbicide; you must possess an applicator's license to purchase or apply it.* Do not apply picloram in highly sensitive areas, such as near homesites, waterways and sensitive crops. Banvel and 2,4-D can be used more safely near waterways. The rates of all chemicals are expressed as active ingredient per acre (ai/acre) because not all products contain the same concentration of herbicide.

Picloram (0.25 pound ai/acre) — This treatment works best if applied in fall or early spring when plants are in the seedling, rosette or early bolting stages. Make aerial applications when shrubs in the area are without leaves; otherwise, use a handgun to get the herbicide under the shrubs. This treatment controls common crupina even when applied during light rainfall (less than 0.05 inch per day).

Picloram (0.5 pound ai/acre) — This is the best treatment when only one application per year can be made. This picloram rate controls common crupina for 2 years, longer than other listed treatments. This rate is not recommended for use on all sites because it may injure susceptible perennial vegetation. Light rain does not hinder effectiveness.

Picloram + 2,4-D amine (0.25 [or 0.5] + 1.0 pound ai/acre) — Picloram plus 2,4-D amine effectively controls bolting plants and decreases viable seed production in flowering plants. Picloram alone often only retards growth of older plants while permitting seed production. Use the higher rate of picloram when using hand sprayers. Some shrubs and perennial herbs are affected by this treatment. Check the herbicide labels. Precipitation within 6 hours after application decreases control because some herbicide washes off the leaves.

Dicamba (0.5 or 0.75 pound ai/acre) — Apply dicamba by handgun or wand sprayer in sensitive areas such as near homesites, waterways and sensitive crops. Warm, dry weather during and after application is needed for good control, especially at the lower application rate. Because weather conditions are variable in early spring, delaying

treatment until May and using the higher rate usually will yield better results. Delaying treatment until May, however, can increase the likelihood of injury to nontarget vegetation.

Dicamba + 2,4-D (0.5 + 1.0 pound ai/acre or 0.75 + 1.9 pound ai/acre) — Dicamba plus 2,4-D is a good treatment near streams and other sensitive areas and where common crupina is bolting or flowering. The low rate is effective on small bolting plants if warm, dry weather follows the application and is less injurious to perennial herbs and shrubs. The high rate quickly stops seed production on flowering plants but injures perennial herbs and shrubs.

Eradication tactics

Eradication requires repeated application of weed control measures and repeated surveys over several years. Surveying for the weed is even more vital than the choice of treatment; common crupina cannot be eradicated if all plants are not found.

Detection survey

Begin searching for common crupina when its flowers are in bloom. Schedule the first surveys from mid-May to mid-June.

The most visible stage in the common crupina life cycle is during seed shed because the bracts enclosing the head open widely to reveal a light straw color and the stems become rusty red. This occurs from late June at lower elevations until late August at higher elevations or whenever rains knock down dead plants and cause bracts to close. This is the best time to find new infestations although treatment at this time is not as effective as when plants are growing.

Concentrate search efforts along trails, roads, livestock holding or watering facilities and other travel routes and disturbed areas. Once you find common crupina in an area, backtrack to look for other plants. Several plants normally are missed before the first plant is detected. After detection, expand the search area to the limits of suitable habitat. Remember, common crupina can grow under trees, shrubs and overhanging rocks.

Use a systematic survey technique. Travel along slope contours and follow landmarks, maintaining an observation path of constant width to avoid skips and overlaps. Surveying is most effective when two to five evenly spaced people walk abreast along the slope contour. Use flags, stakes, metal fence posts, tree paint or surveying tape to mark the boundaries of the infestation for subsequent treatment and inspection.

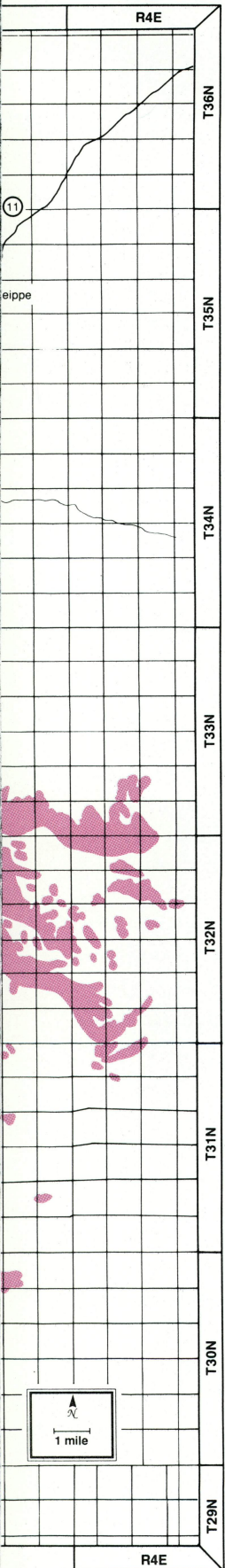


Fig. 1. Succulent cotyledons of crupina usually have a red midvein.



Fig. 3. Rosette of crupina has dissected leaves.



Fig. 5. Showy crupina flowers are lavender to purple.



Fig. 2. (Left to right) Common crupina leaves progress from entire on the older (lower) part of the plant to lacy on the younger (upper) part of the plant.

Fig. 4. Most crupina plants have a single stem.

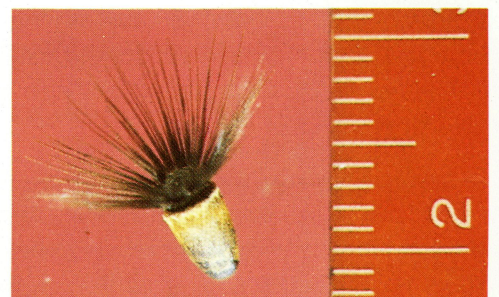
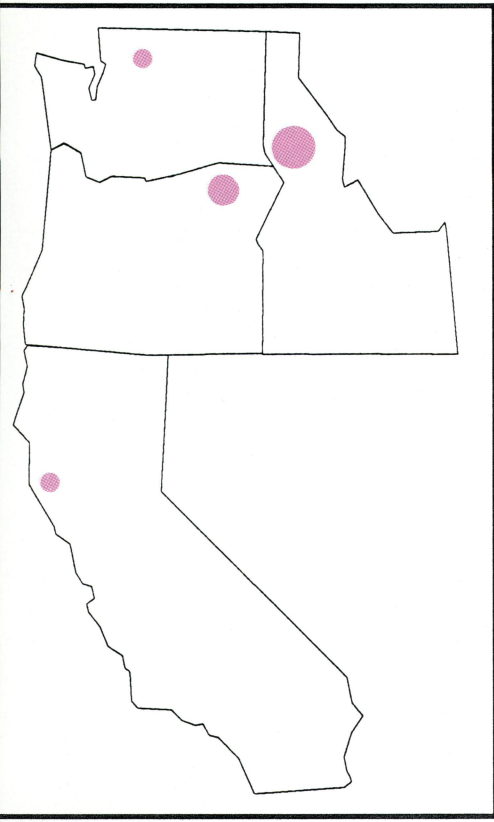
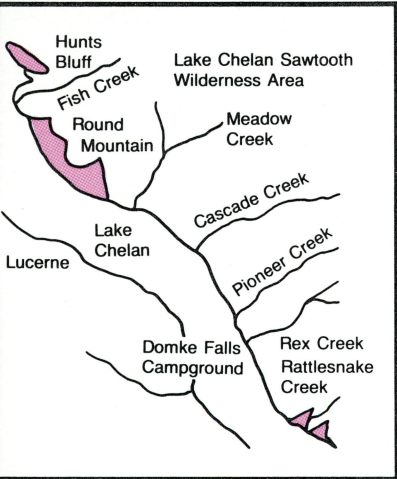


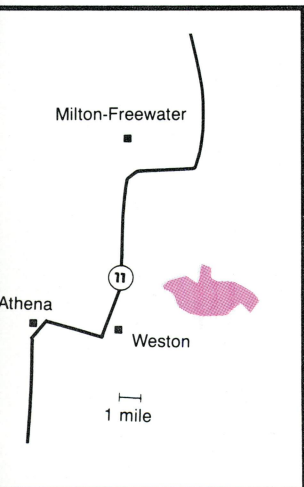
Fig. 6. Crupina seeds are about the size of a wheat kernel (see metric scale).



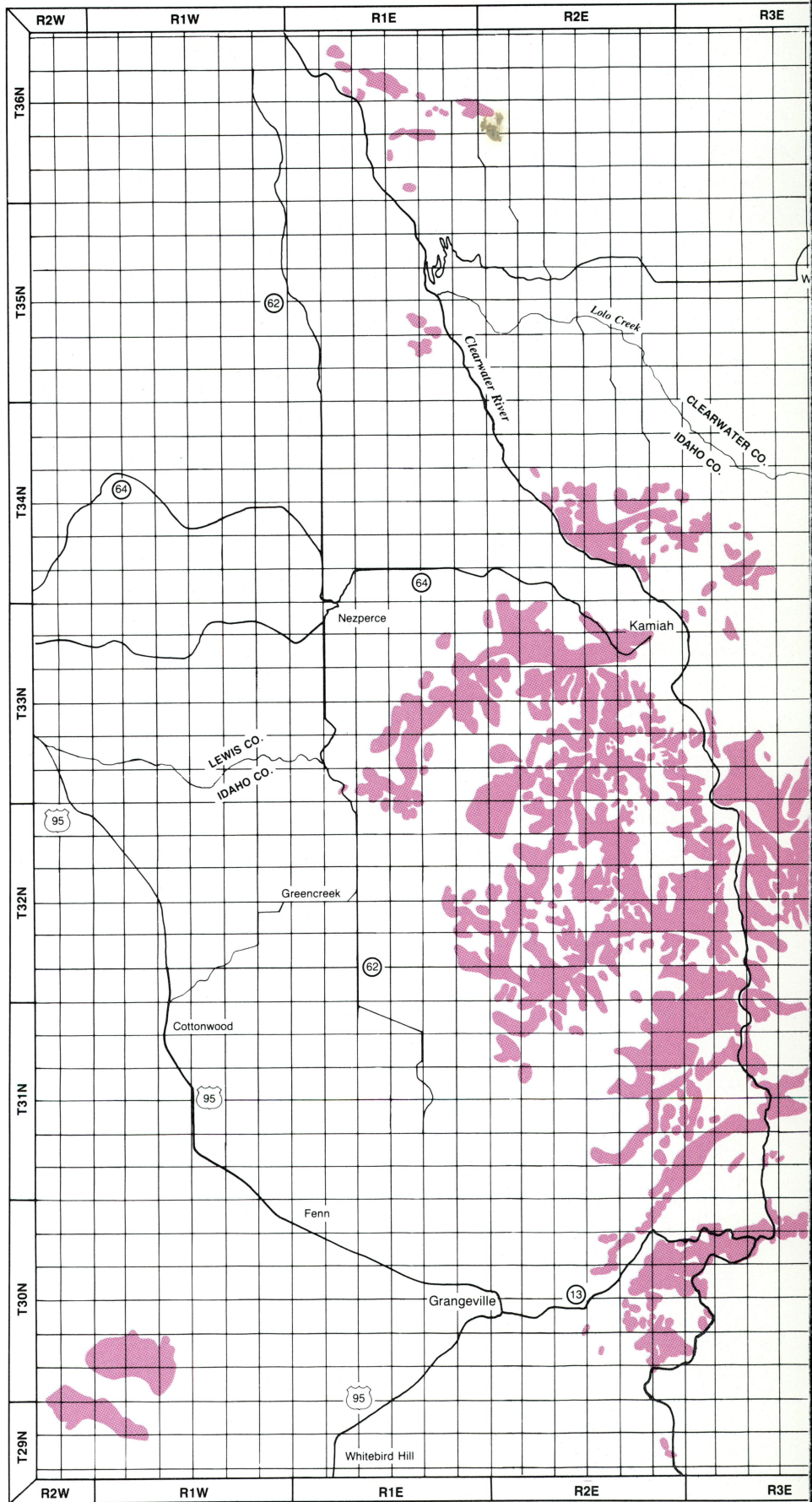
Recorded sites of common crupina in the United States.



Common crupina in Washington.



Common crupina in Oregon.



Common crupina in Idaho.

Appraisal survey

Two weeks after using one of the control measures, survey the area to determine the effectiveness of control. Use the same survey technique that was used in the detection survey. Carry a small hand sprayer to spot treat surviving common crupina with a combination of 0.5 pound ai per acre picloram plus 1.0 pound ai per acre 2,4-D amine. Although more labor intensive, pulling the weed by hand also can be effective. Hand pulling is much slower than spraying and disrupts the efficiency of the survey crew if more than 10 common crupina plants are found per hour of work. If seeds are present, pull plants and carry off the seed heads in a plastic bag to be destroyed.

Eradication schedule

Use the point system in University of Idaho EXP 701, *Eradication Manual for Common Crupina*, for eradication of small infestations. Even when eradication is apparent, conduct appraisal surveys each year for 7 years to ensure that no common crupina plants escape eradication. Only after the final appraisal survey in the seventh year can eradication be verified. In sensitive areas around homesites with very small common crupina infestations, multiple hand pulling treatments each year to prevent seed set can be used to eradicate common crupina. Details of crupina eradication procedures are fully outlined in University of Idaho EXP 701.

Revegetation

Common crupina readily invades depleted grasslands, and infestations in pasture or rangeland are much more severe where the competing perennial vegetation is sparse. These sites usually need revegetation to recover after treatment of common crupina infestations and to enhance control measures. A dense stand of perennial grass also resists invasion by other weed species.

Revegetate with perennial grasses. Historically, the plant communities infested with common crupina were perennial grasslands. Replanting with grasses will return the area to a more natural state. Furthermore, established perennial grasses tolerate the herbicides used to destroy

common crupina, while broadleaf herbaceous plants typically are susceptible.

Plant grass in fall or late winter before broadcast herbicide application. Best results can be expected from a February or March seeding. Several grass species are well adapted to most of the habitats in which common crupina lives. Species adapted to the Pacific Northwest include Oahe intermediate wheatgrass (*Thinopyrum intermedium* subsp. *intermedium*), Luna pubescent wheatgrass (*Thinopyrum intermedium* subsp. *barbulatum*), Nordan standard crested wheatgrass (*Agropyron desertorum*) and tall oatgrass (*Arrhenatherum elatius*).

Broadcast seeding generally has met with limited success, and several years are required to establish a stand. Slow stand establishment allows annual weedy grasses to increase and suppress the new seeding. Revegetation is most successful with standard seedbed preparation and grass seeding into the soil. Where the soil is productive and annual grasses are controlled, nitrogen fertilization can help maximize stand establishment, return on investment and long-term crupina control. Ask your county Extension agricultural agent or other consultant for fertilizer recommendations.

Pesticide residues — Recommendations for use are based on currently available labels for each pesticide listed. If followed carefully, residues should not exceed the established tolerances. To avoid excessive residues, follow label directions carefully with respect to rate, number of applications, and minimum interval between application and reentry or harvest.

Groundwater — To protect groundwater, when there is a choice of pesticides, the applicator should use the product least likely to leach.

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