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Fact Sheet 05-51

RUSSIAN KNAPWEED CONTROL

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Why Control Russian Knapweed?

Russian knapweed (RKW) is a highly aggressive perennial weed. Although it has pretty flowers, this weed can overrun a home landscape or pasture within a year if left unchecked. It is toxic to horses, reduces property value, and increases maintenance costs and chores. The dead stems and flowers at the end of a growing season become fuel for fire the following year.

Russian knapweed is defined by Nevada state law as a noxious weed in NAC 555. According to NRS 555.150 "…every person owning, controlling, or occupying lands in this state…shall cut, destroy, or eradicate all weeds declared noxious …before such weeds propagate and spread…" All property owners are responsible for controlling noxious weeds on their properties. If they do not, county government is authorized to have the work done and bill the owner for the costs incurred. If the bill is not paid, the county can place a lien on the property.

Life Cycle

It is important to be able to identify various stages of growth of RKW to facilitate timing of management treatments. Plants emerge in very early spring after soil temperatures warm above freezing. The plants grow in a rosette with leaves that can be identified by their gray-green color, hairy surface, and wavy edges (Figure 1).

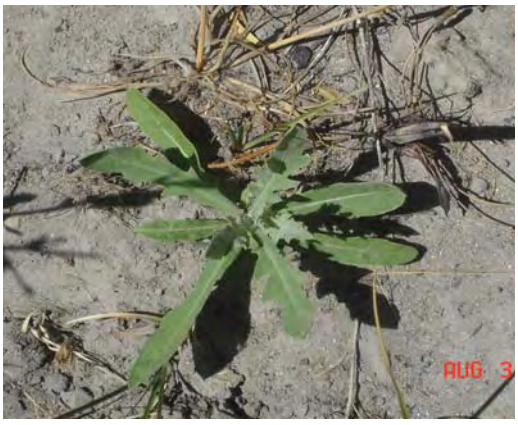

Figure 1: Rosette stage

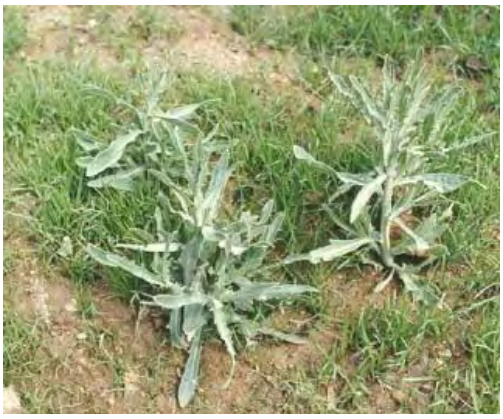

Figure 2: Stem elongation or bolting stage

When a mature plant is pulled out of the soil, the roots are black in color. The roots are extensive, strong, and grow deep in the soil. New plants develop and spread easily from root buds and pieces. The plants bolt (stem elongation after rosette stage) in late May to mid-June producing stems and leaves with fine gray hairs (Figure 2). Flower buds develop after plants have bolted (Figure 3). The plants bloom from June to October with pink to purple flowers about ¼ inches to ½ inches in diameter (Figure 4).

Figure 3: Bud stage

Figure 4: Bloom stage

Management Information

Russian knapweed can take several years to control because of its extensive underground root system. Keys to controlling RKW include stressing the plant to deplete the stored energy in the roots, preventing new seed production, controlling plant spread via root pieces or root bud growth, and establishing and maintaining competing vegetation. No single control method works. An assortment of strategies must be used.

Hand pulling, mowing, and tilling may successfully control RKW, if they are done frequently and consistently over several years. Herbicide application also requires vigilance and persistence. Ultimately, long-term success is dependent upon establishing competitive vegetation. The effectiveness of mowing, tilling, reseeding, or planting new desirable plants increases after vegetative suppression of knapweed with herbicides. Before spraying, remove last year's dead foliage to allow chemicals to reach the underlying new growth of the weed (Figure 5). Bag the dead parts to eliminate any remaining seed and to avoid scattering seed to un-infested areas. When selecting an herbicide, make sure it will not prevent establishment of desirable vegetation through a lasting soil effect (residual).

After spraying, do not remove sprayed plants until the plants wither and turn brown. This may take weeks to become evident (Figure 6). It is essential to reseed or transplant desirable plants into the area once the infestation has been reduced. It is then important to maintain seedling vigor with proper fertilization and irrigation.

Figure 5: Remove and bag dead seed stalks before spraying

Figure 6: RKW six weeks after spring herbicide application

Mechanical Methods to Control Russian Knapweed

Control Technique	Application Timing	Frequency of Treatment	Remarks
Hand pulling*	Early spring to fall	Repeat when new plants appear	Slightly effective in small areas only, when soil is moist enough to allow more roots to be removed, and before seeds set. This will contain the weed, but not eliminate it.
Digging	Early spring to summer	Repeat when new plants appear	More effective than pulling. Works best with moist soil. Remove as much root system as possible, even small pieces, to a depth of 12 inches. Screen the soil through ¼-inch hardware cloth to remove roots. Remaining roots will produce new plants.
Deep plowing / tilling	Spring through fall	Treat two to three times annually for at least three years.	Root pieces can be killed by burial below 12 inches. Plowing buries roots, but tilling may propagate and spread the plant unless continuously used to eliminate new growth
Mowing	Spring and summer	Repeat more than three times annually.	May stimulate new growth. Seed may be produced on low-growing mowed plants. Follow with a fall herbicide application.
Light and moisture exclusion	Before plants emerge in late winter or early spring	Keep completely covered or buried for at least one year. Do not irrigate.	Use straw, manure, sheet metal, paper, plywood, etc. to exclude light and possibly moisture.
Solarization	Before plants emerge in late winter	Do in late winter and keep covered until following winter	Use at least 4 mil clear plastic (black plastic takes longer) to cover the area. Mow first if weeds or old stems are taller than 4 inches. Moisten area and cover. Must be covered in full sun for a minimum of 10 hours per day. Bury all the edges of the plastic with soil.
Burning	Not recommended	Not applicable	Although burning eliminates top growth, root growth is vigorously stimulated.

*****There are chemical compounds in Russian knapweed that can cause varying degrees of skin irritation. Always wear protective gloves and avoid getting the sap on your skin, in your eyes, and into cuts. Thoroughly wash hands and exposed skin after contact with this weed.

Chemical Methods to Control Russian Knapweed*

Chemical	Trade Name**	Application Timing	Remarks***
Chlorsulfuron	Telar ®	Late spring, summer, fall	**For non-crop industrial sites only**. Apply at pre-bloom to bloom, or fall rosette stage. Expensive and difficult to obtain. Should not be used on soils with a pH above 7.5.
Clopyralid	Transline ®, Stinger ®	Spring to early summer	For use in rangeland or grass pasture. **Not for use in home landscapes or lawns**. May only suppress RKW. Apply prior to bud stage while plants are actively growing. Do not plant grasses for 30 days after treatment. Expensive and difficult to obtain. May leach into ground water.
Clopyralid + 2,4-D	Curtail ®	Spring	For use in rangeland or grass pasture. **Not for use in home landscapes or lawns**. Apply after rosettes emerge but before flower stems develop. May only suppress RKW. Do not plant grasses for 30 days after treatment. Expensive and difficult to obtain. May leach into ground water.
Glyphosate	Roundup ®, Kleenup ®, etc	Late summer or fall	Apply at late bud to flower stage. Repeated applications are required. Non-selective, **kills desirable vegetation including lawn**.
Picloram	Tordon ®	Fall after first hard frost. Late spring before and during flower stem elongation	**A restricted use herbicide, it requires a certified applicator to use it.** Afterward cultivate deeply and seed with grasses. May leach into ground water.
Triclopyr + clopyralid	Redeem R&P ®	Late spring to early summer. Late fall	For use in rangeland or grass pastures. **Not for use in home landscapes or lawns**. Apply at early bud to mid-flower stage or fall regrowth. Add label recommended surfactant. Expensive and difficult to obtain. May leach into groundwater.
2,4-D	Various	Spring, early summer	Some formulations may be restricted use. Apply to rosettes or during early growth. Reapply as new growth emerges. Formulations for brush control may be necessary. Use a crop oil or surfactant.

*****This table is not intended to be a complete list of suitable chemicals. ******Brand names are provided for example purposes only. Other brands may also be licensed for use in Nevada. Information is offered with no discrimination. Listing a commercial product does not imply an endorsement by the author, University of Nevada Cooperative Extension, or its personnel.
*****CONSULT LABEL FOR RATES AND APPROPRIATE SITE USE.**

ALWAYS READ AND FOLLOW LABEL DIRECTIONS. Many of the chemicals listed here are not available at garden centers or nurseries. They may need to be purchased through weed control districts or wholesale landscape supply companies. They may be available only in larger quantities. It may be best to hire a restricted use pesticide applicator to control RKW. Timing of any herbicide application is critical. Wear protective clothing when mixing and applying chemicals. Avoid application or drift to desirable plants including lawn. Do not contaminate water or areas where surface water can run off to desirable plants, wells, irrigation ditches, creeks, or storm drains. Do not move treated soil. Some of these products are long-lasting in the soil and can damage subsequent desirable vegetation planted after treatment. Once an herbicide has been applied and the infestation has been reduced in size, till the soil and establish desirable competitive plants.

References

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Photography

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