

Knapweed Impacts

Knapweed species can have a devastating impact on land within Arapahoe County. Prolific seed production in combination with invasive and allelopathic qualities often results in quick establishment in native areas. Takeover by any knapweed specie can cost landowners hundreds to thousands of dollars each year due to control costs, losses in crop yield, and the amount of supplement feed needed because of decreased forage production. Outside of cost is the impact on native wildlife. Smaller animals are affected when native grasses are replaced. This leaves them without adequate cover to hide them from predators and without a readily available food source. An example is the Preble's Meadow Jumping Mouse, it is listed as an endangered species and diffuse knapweed is taking over its primary habitat. Although small animals are often forgotten, this example illustrates how knapweed infestations can affect native ecosystems. Loss of native grass also affects larger grazing animals. Deer and elk will rarely browse on adult knapweed plants, causing them to move on to other areas. Increased erosion is also a result of infestations. In the case of diffuse and spotted knapweed, this increase is a result of decreased ground cover and taproots with few fine roots at the surface to hold the topsoil in place. These are just few examples of the impacts that knapweeds have on lands in Arapahoe County and they can be more or less severe denending on the situation

Knapweed Control

Knapweed control is a long-term proposition unless the infestation is small enough where eradication is feasible. Persistence is a key aspect to control, where proper timing and the use of effective tools throughout the growing season yields positive results. It is important to remember that large infestations happen over time and it is not practical to believe that just one weed control effort will get the job done. The good news is that control is possible with a management plan that utilizes all of the available integrated weed management techniques over several growing seasons.

Knapweed Allelopathy

It has been speculated for years that knapweed plants, in this case spotted knapweed, secrete a chemical into the soil that kills off surrounding plants. This phenomenon is known as allelopathy and helps to explain why these plants take over vast amounts of disturbed and healthy lands rapidly. Colorado State University researchers have successfully identified this chemical as catechin. Spotted knapweed produces two types of catechin, positive and negative, meaning they are the same compound except that they are the mirror images of each other's structure. The negative catechin acts as a natural herbicide. It is similar to a broadleaf herbicide as some grasses and grass-like plants show some resistance to it while it is effective at controlling common weeds like pigweed and lambs quarters. This chemical will affect diffuse knapweed but as expected, has no effect on spotted knapweed. The positive catechin has anti-bacterial properties and has been available commercially for several years in the form of anti-aging compounds and antioxidants. Now that this discovery has been made, expect to see a commercially produced catechin herbicide that will be available to the public within two years. From a weed control standpoint, the question to be answered is whether or not researchers can use this information to nullify the effects this chemical has on desirable vegetation.

For More Information Contact:

Arapahoe County Weed Control
10730 E. Briarwood Ave., Suite 100
Centennial, CO 80112
Phone: (720) 874-6713
Fax: (303) 798-6054
www.co.arapahoe.co.us



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Knapweeds of Arapahoe County



Diffuse Knapweed



Diffuse knapweed is an introduced species from Europe. It typically invades waste areas but can be found on rangeland, pastures, riparian areas and along roadsides. Growing conditions in Arapahoe County tend to favor growth since diffuse knapweed does best in semi-arid growing conditions. Infestations are widespread throughout the western portion of Arapahoe County.

Mature plants can grow to heights of 1 to 3 feet from a single stem that produces many branches. Flowers are white, although they can be purple in color. This purple flower variation is often mistaken for spotted knapweed except that the presence of sharp bracts on the base of the flower is unique to diffuse knapweed. A single plant can produce up to

18,000 seeds with the seeds able to remain viable in the soil for ten years. Its life cycle is biennial or that of a short-lived perennial. This noxious weed kills off competing vegetation by producing a natural



growth inhibitor, this concept is known as allelopathy.

Spotted Knapweed

Spotted knapweed was introduced to the United States from Central Europe. It has spread through much of the upper mid-west to infest over 6 million acres. It is suited to a wide variety of environmental conditions, infesting waste areas, hillsides, pastures, rangelands, and riparian areas. It does best in areas with light textured soils that are well drained and receive some precipitation during the summer months.



Spotted knapweed is a simple perennial, re-growing from its taproot each year to heights around 4 feet. Flowers are purple with dark spots on the bracts at the base. Unlike diffuse knapweed, spotted knapweed flower buds are slightly hairy to the touch, which is a key identification trait when the two different flowers are similar in color. Mature plants can produce 1000 to 18,000 seeds each year. This combined with its perennial growth habit and allelopathic abilities, makes control difficult.



Russian Knapweed



Russian knapweed is another invasive weed from Europe. It invades waste areas, croplands, rangelands, roadsides and riparian areas. Not only does this plant spread rapidly, it is difficult to eradicate once it is established. This weed should be a concern to horse owners because it is poisonous. There are very few known infestations in Arapahoe County at this time.

Russian knapweed is a long-lived perennial that reproduces both by seed and horizontal creeping roots. These roots are black or sometimes brown but have a scaly appearance to them. Flowers are a pink, lavender or sometimes white in color. The bud or base of the flower is more swollen in appearance than the other species of knapweed and is urn shaped. Mature plants typically reach a height of 1 to 3 feet. Russian knapweed does have allelopathic qualities



similar to spotted knapweed, enabling it to take over areas quickly.