

Russian Thistle *Salsola kali*  
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## Introduction

Many southern Saskatchewan residents are accustomed to seeing a tan bushy plant tumble across the prairie landscape in the wind. Russian Thistle is a tumble weed brought over from Europe and Asia initially as a contaminant of flax seed (Government of Saskatchewan, 2004). The Thistle is a green bushy plant that can grow as wide as it is tall, or up to one meter (Government of Saskatchewan 2013). The plant is an invasive species efficient in fast germination and emergence, making it a big competitor for the early season sunshine (Government of Saskatchewan 2004). The plant also has a very short seed life of 3 years or less which can make it easy for well managed control techniques to eradicate the species from crop land quickly (Government of Saskatchewan, 2013).

## Identification

*Salsola kali* or Russian Thistle is a species introduced to Saskatchewan from Europe and thrives in the prairie ecosystem in fields, roadsides, and waste areas (Government of Saskatchewan 2013). It is bushy with many branches and can grow up to a meter in height as well as a meter or more in width as well (Government of Saskatchewan 2013). When growing the Russian Thistle is green and succulent but when mature the plant dries up to tumble across fields for seed dispersion leading to the nickname Russian Tumbleweed (Government of Saskatchewan 2013). The stems often have a reddish stripe (Government of Saskatchewan 2013). The leaves have an alternate arrangement with a linear shape and entire margins and the later leaves are shorter tipped with stiff spines to protect against predators (Government of Manitoba, 2013).



Figure 1.  
Illustrates the red striped stems as well as the linear leaf shape with entire margins.  
(Photo from Mary Ellen (Mel) Harte, Bugwood.org)

## Adaptations

### The Russian Thistle is a C4 Plant

Russian thistle grows very well in semi-arid regions such as southern Saskatchewan being able to survive with very little water (Dwyer and Wolde-Yohannis 1972). Reimann and Breckle also demonstrated in their study that Russian Thistle can survive with varying tolerances for salinity (1995). The abilities of the Russian Thistle to survive with little moisture and with a tolerance for salinity allow it to colonize areas other plants cannot. As a C4 plant the Russian Thistle can use CO<sub>2</sub> more efficiently and can also close their stomata during hot days to stop moisture loss (Government of Saskatchewan 2004). On cooler and moister days C3 plants are the more efficient type of plant (Government of Saskatchewan 2004).

### A Short Seed Life

The Government of Saskatchewan also reports studies being done on the Russian Thistle that show a short seed life which can allow for fast adaptation to management practices and may evade control techniques (2004). Added to the short seed life Russian Thistle has a very fast germination and emergence rate, allowing the species to beat nearly any crop or plant in a race out of the ground (Government of Saskatchewan 2004). This fast emergence is a great competitive advantage because it allows the seedlings to gain access to the sun and start growing taller before other plants gain opportunity to shade them out.

### The Tumbleweed

Although the Russian thistle has short seed viability should mean that eradicating the weed from a field should be easy within one to two years but the tumbling seed distribution method allows the weed to spread its up to 100,000 seeds per plant to new areas very quickly over winter if some plants are missed with a control technique (Government of Saskatchewan 2004). This tumbling ability combined with a tendency to adapt to new areas can result in fast spreading of superior populations when not supervised or monitored.

## Control

### Early and Narrow Row Seeding

The Government of Saskatchewan suggests seeding early will take advantage of the cool weather to allow the C3 crops to out compete the C4 Russian Thistle, it will also allow a faster closing canopy (2004). The faster closing canopy will take away sunlight from the germinating weeds beneath it. Winter wheat and other winter cereals would be the most effective with this method. Seeding with a narrow row will also allow the canopy to close faster and allow the crop to out compete the weeds.

## Shelterbelts

Tree rows or other kinds of shelterbelts act as a wind block to stop the wind from spreading the tumbleweed's seed across the fields (Government of Saskatchewan 2004). The shelterbelt also acts as a net to catch the weeds and although there may be an abundance of Russian Thistle in the shelterbelt itself the weeds can be easily managed with tillage or mowing (Government of Saskatchewan 2004).

## Post Harvest Tillage

Frank Young et. al. suggest tillage within 2 weeks after harvest to minimize the water use, seed set, and spread of broken off tumbleweeds in the wind (1995). Tillage or destruction of the plants when still green can almost completely stop the spread of seeds in the field. A bad management practice is to till when the weeds are dry and standing as this can aid in the spread of seeds in the field.

## Grazing

Tim Antill et. al. explain in their report on control of the Russian Thistle in the Jasper National Park that grazing and manual removal of the plants can be effective without negative consequences to the native species in the ecosystem (2012). Care must be taken to watch consumption of the plant by animals as large amounts can become poisonous and dangerous (Antill et. al. 2012). This system is more practical in rangeland or small areas that can be monitored.

## Summary

Russian Thistle is an invasive species capable of rolling across fields spreading thousands of seeds per plant. Their short seed life allows them to adapt faster as weaker varieties die off but stronger ones germinate and thrive. The short seed life also allows efficient management practices to successfully eradicate populations of the species within a few years. The Russian Thistle is a C4 and can thrive in hot dry weather even in saline conditions but will fall to C3 competitors in cool and wet conditions. Seeding techniques, shelterbelts, tillage and grazing are all organic control measures that can be utilized to combat this tumbleweed and maximize crop yield.

## References

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