Effectiveness of methods to control Russian olive tree saplings

Russian olive trees are locally invasive plants that are not native to Alberta. They have been grown as ornamentals and as shelter belt plants for decades. Unfortunately, they have spread aggressively, outcompeting and choking-out native shrubs and trees. The local semi-arid climate and soils in the city of Medicine Hat and surrounding area are favourable to their colonization, to a degree that can be described as uncontrolled infestation. They can rapidly dominate stream banks and the shores of ponds, reservoirs, and lakes (riparian areas). They can negatively impact the health of the riparian areas and the water body. For more information, please read SEAWA's info sheet on Russian olive here. There is a need to control the infestation of Russian olive trees. First and foremost, do not plant them, and do not sell them regardless of their not being officially prohibited. It is a local, not a province-wide, issue. Secondly, we can also help by removing those that are already growing.

Russian olive plants can be grouped into seedlings, saplings, young trees, and mature trees. We conducted an experiment on Earth Day, April 20, 2019 at Connaught pond, College Drive, Medicine Hat to determine which known method or methods (treatments) is/are the best for controlling Russian olive saplings. We selected 15 saplings (average height 99 cm and diameter at the base 2 cm) located at average distance of 8 m from the water's edge, and randomly assigned 3 saplings to each of these four methods: 1) physical extraction of whole plant and main roots (using tree planter shovel & a pickaxe); 2) cutting stem at the base (using a pair of loppers); 3) cutting stem at the base + immediate application of Roundup® on the stump; and 4) cutting stem at the based + immediate application of a mixture of Roundup® and Killex® on the stump. Roundup® and Killex® are herbicides. Herbicides were painted (not sprayed) on the cut part and exposed base (stump) of the saplings using a small foam brush. Spraying chemicals cannot occur within 30 m of water bodies without special approval from Alberta Environment. Three saplings received no treatment.

RESULTS: We collected plant data on August 12, 2019. We found no regrowth for the physical extraction method as well as for the two methods that involved cutting the stem at the base and applying herbicides on the stump. Cutting the stem at the base without herbicide application was ineffective, with an average regrowth of 8 stems per plant and average height of 21 cm. Saplings that were not treated increased in height by an average of 3 cm with no

change in stem diameter at the base. Please note that these results were from saplings only and may not apply to older plants.

Weather during the study period: Total Precipitation April 20 to August 12, 2019 was 89 mm; Mean temperature = 15.45^{o}C; Number of days with max temperature at 30^{o}C and above: July = 13; August = 4.

CONCLUSIONS: Physical extraction is as effective as cutting saplings at the base of the stem followed by the immediate application of herbicides. Physical extraction is a good method as it avoids the use of herbicides. In our experience, physical extraction of seedlings, which are younger than saplings and therefore have less extensive root systems, can be effective. It is important to extract seedlings around saplings because these will eventually grow better after saplings are removed. Small scale Russian olive seedling and sapling removal initiatives (less than 100 plants) can be done by volunteers using the physical extraction method. With the appropriate machinery, physical extraction can also be mechanized. However, care must be taken to avoid excessive soil disturbance because that may invite weeds. Cutting plants at the base of stems and applying an herbicide immediately on the fresh stump would be appropriate for larger-scale initiatives. Cutting at the base of stems can be mechanized; application of herbicides (no spraying) must be done by those with appropriate training and equipment. The advantage of this method is the avoidance of soil disturbance that can be important on steep slopes.

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Amy Adams counting and measuring Russian olive regrowth, August 15th, 2019. Photo credit: Brooklyn Neubeker

Regrowth from ‘cut stem at the base’ method, August 15th, 2019. Photo credit: Brooklyn Neubeker

No regrowth from ‘cut stem at the base and apply herbicide’ method, August 15th, 2019. Photo credit: Brooklyn Neubeker

Ron Linowski applying an herbicide to a freshly cut stump, April 18th, 2019. Photo credit: Natasha Rogers