

Leafy spurge control in a riparian area without the use of chemicals

Riparian areas are strips of land next to a body of water (streams or lakes/reservoirs). SEAWA started a field-plot experiment on the control of leafy spurge in a riparian area of the Seven Persons Creek in the spring/summer of 2018. The experiment was continued in the spring/summer of 2019. This site has been heavily infested with leafy spurge despite the presence of bio-control organisms, hawk moths and flea beetles, released previously by researchers. Leafy spurge is a perennial weed; it grows strong, extensive and deep root system from which smaller roots and shoots emerge. It has numerous yellow flowers from which numerous seeds are produced. It is toxic to cattle and horses but tolerated by goats and sheep. Chemical weed control in riparian areas is undesirable. Therefore, SEAWA laid out an experiment that used cultural weed control methods.

Experimental plots were 1m x 1m (1 sq. m.) in size and cultural methods used 1) a tree planter shovel to manually dig-out leafy spurge roots, and 2) the application of a thick layer of wood chip mulch to shade out leafy spurge. Treatments had 6 plots each (replicates) except for the No Treatment plots which were 3. Experimental treatments and methods consisted of:

	2018	2019
T1 – Dig Only	Dug out roots in April, May, June and August	Dug out roots in May and August
T2 - Mulch Only	Applied 7-8 cm thick wood chip mulch in May	Topped-up mulch in May 2019
T3 – Dig +Mulch	Dug out roots in April, May, June and August in 2018 + Applied 7-8 cm thick wood chip mulch in May	Dug-out roots again in May and August 2019; topped-up mulch in May
T4 – No Treatment		

Data were collected in spring/summer of 2018 and 2019 for each of the different plant variables as listed in the Results below. However, data collection for the No Treatment plots was started in August 2018. Statistical analysis was performed for data beginning August 2018. Data of prior months are presented for completeness of information.

Results:

- Length of main roots per sq. m.– Both Dig Only and Dig + Mulch Treatments were effective in significantly reducing the length of main roots over 2018 season but increased again in 2019 (Fig. 1)

- Number of stems per sq. m. – All Treatments had significantly fewer stems compared to No Treatment. (Fig. 2)
- Height per stem – Mulch Only Treatment had the tallest stems (Fig. 3)
- Number of flowers per stem – Dig Only and Dig + Mulch Treatments had the least number of flowers both years. Peak flowering was in May and seeds began to set in June. (Fig. 4)
- Number other weeds per sq. m. – Dig Only Treatment had the highest number of weeds, notably Canada thistle, followed by Mulch Only, and Dig + Mulch Treatments. (Fig. 5)

Discussion and Conclusion:

Digging out leafy spurge main roots with or without mulch was effective in reducing the length of main roots from which other roots and shoots emerge. Digging out leafy spurge was effective when done four times during the season. Digging out main roots resulted in fewer number of stems, that were shorter and younger, that eventually produced fewer number of flowers. Although mulching only also had fewer number of stems, these were mature stems that produced greater number of flowers. Application of mulch by itself was ineffective. However, digging out leafy spurge provided an opportunity for other weeds to colonize, especially Canada thistle, another pervasive weed with an extensive root system from which new plants emerge. Treatments were revised in May-June 2019, and data will be collected in summer 2020. Treatments were determined such that weed colonization would be prevented by planting desirable plants (native shrubs or grasses) in plots where leafy spurge roots were dug out during 2018 and 2019 summers. The Treatment Dig + Mulch needs to be re-considered. In banks with steep slopes, mulch pieces slid downhill and were difficult to keep in place. In addition, mulch application involved additional work and cost.

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For more information on leafy spurge:

<https://abnvasives.ca/wp-content/uploads/2017/11/FS-LeafySpurge.pdf>

https://plants.sc.egov.usda.gov/plantguide/pdf/pg_eues.pdf

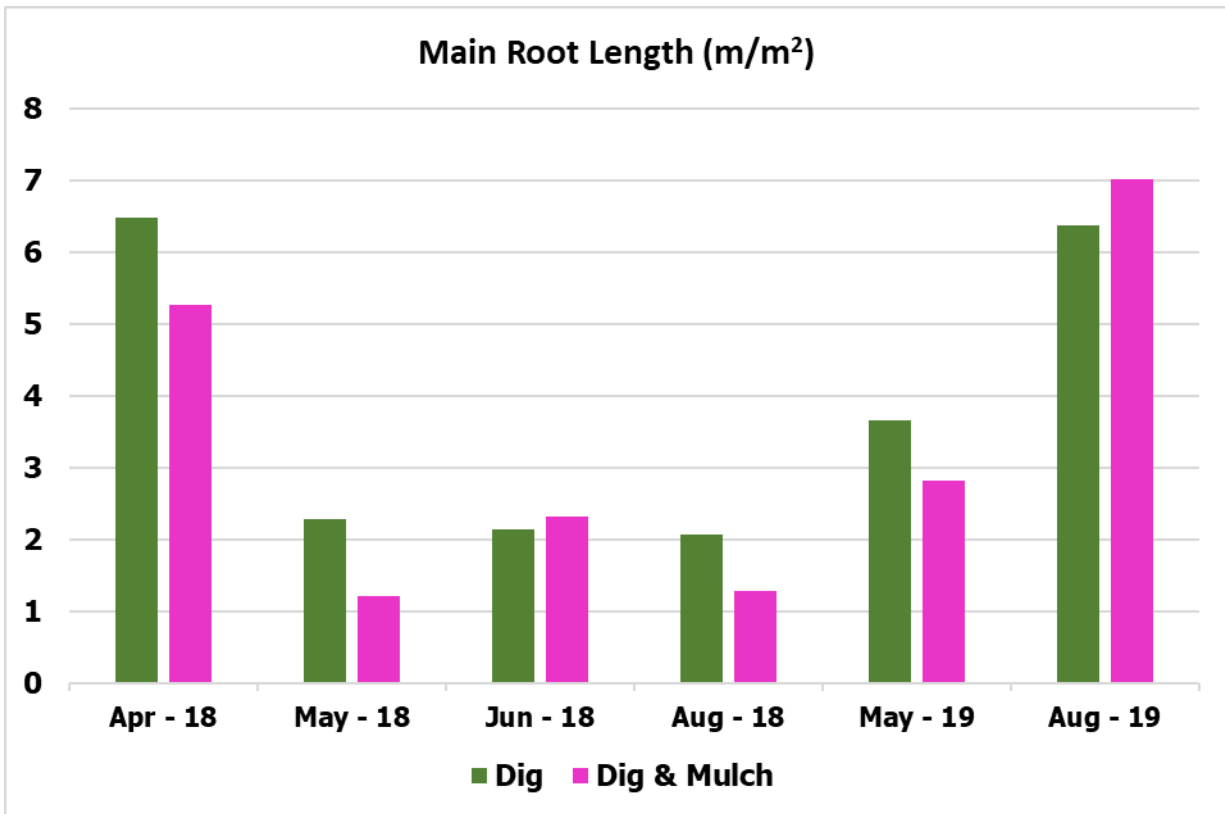


Fig. 1 Average main root length per square meter

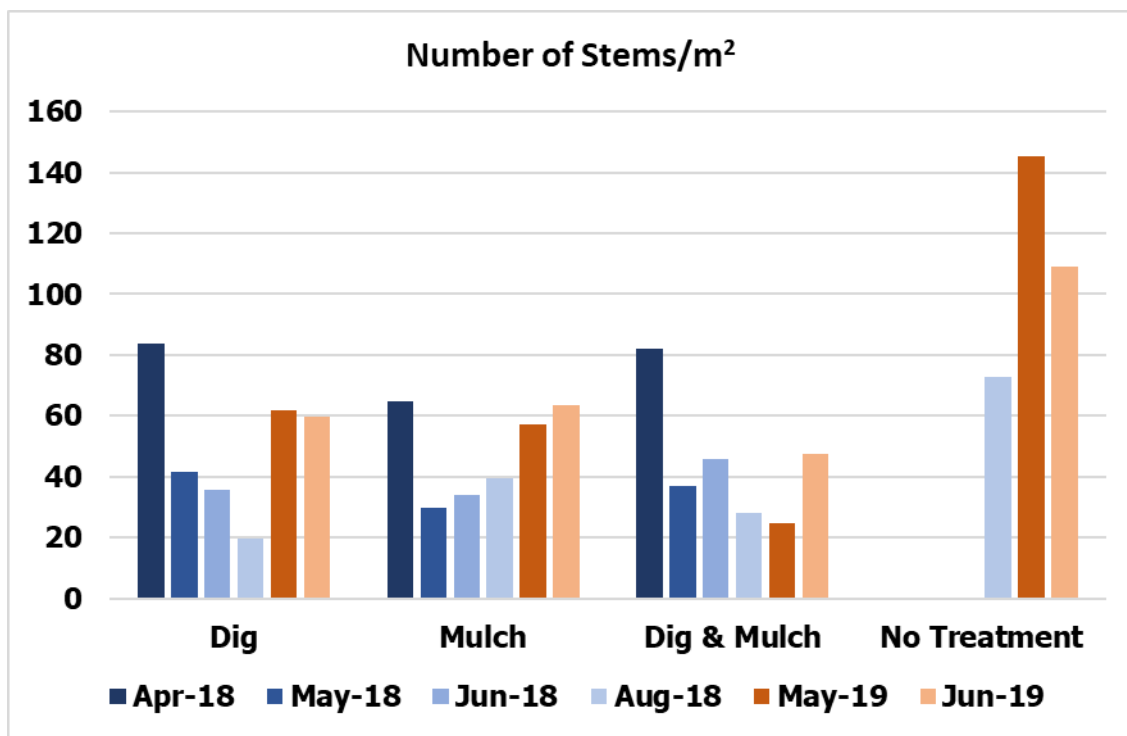


Fig. 2 Average number of stems per square meter

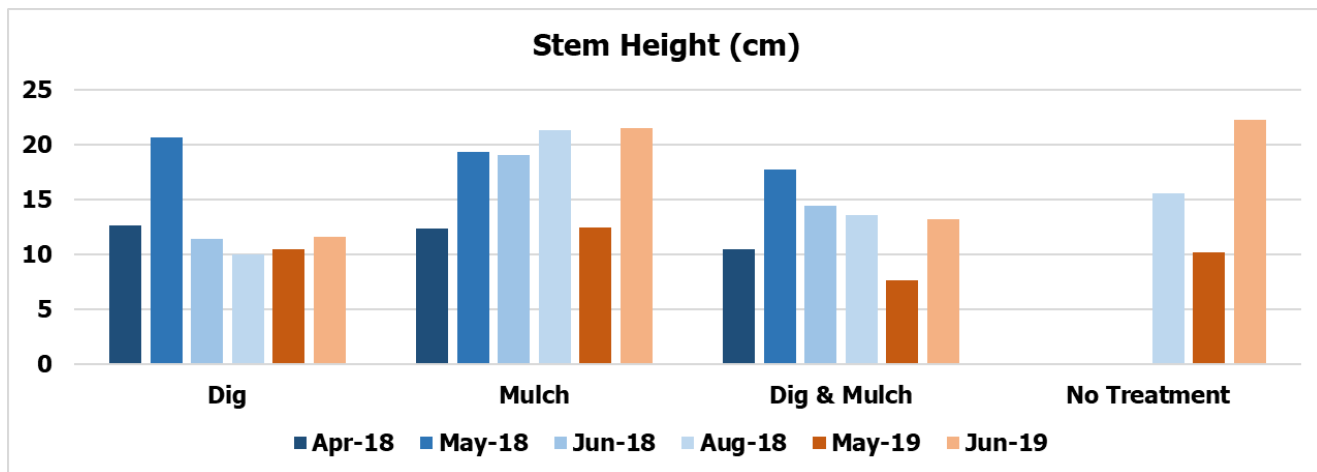


Fig. 3 Average height per stem

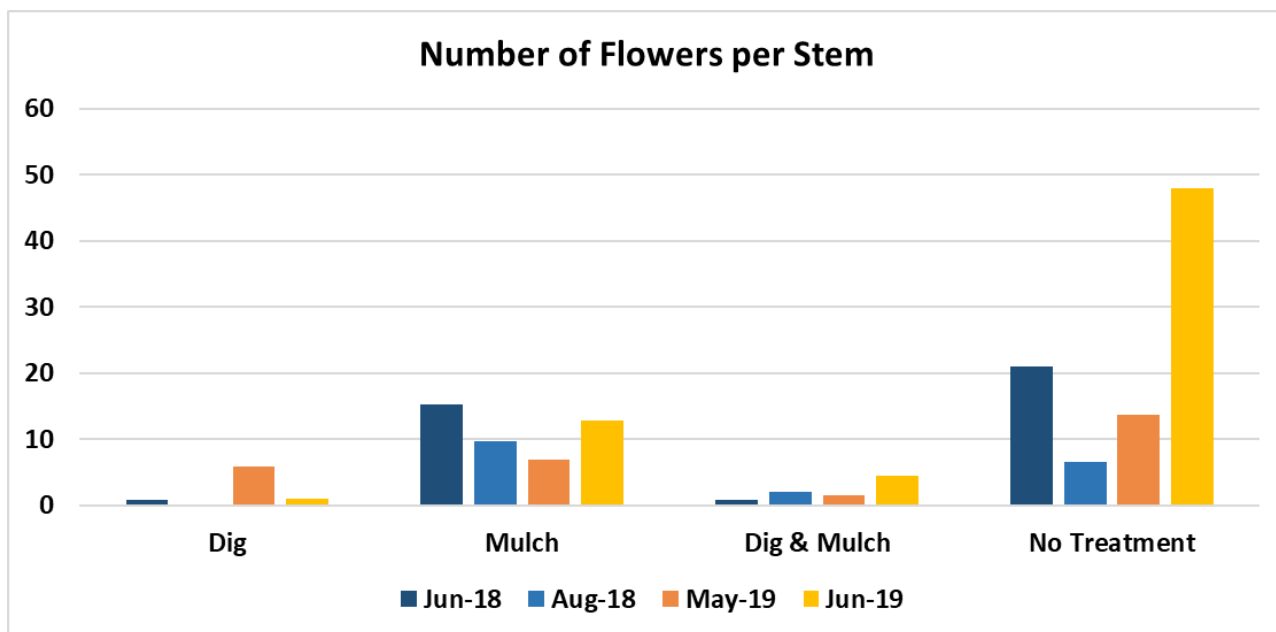


Fig. 4. Average number of flowers per stem

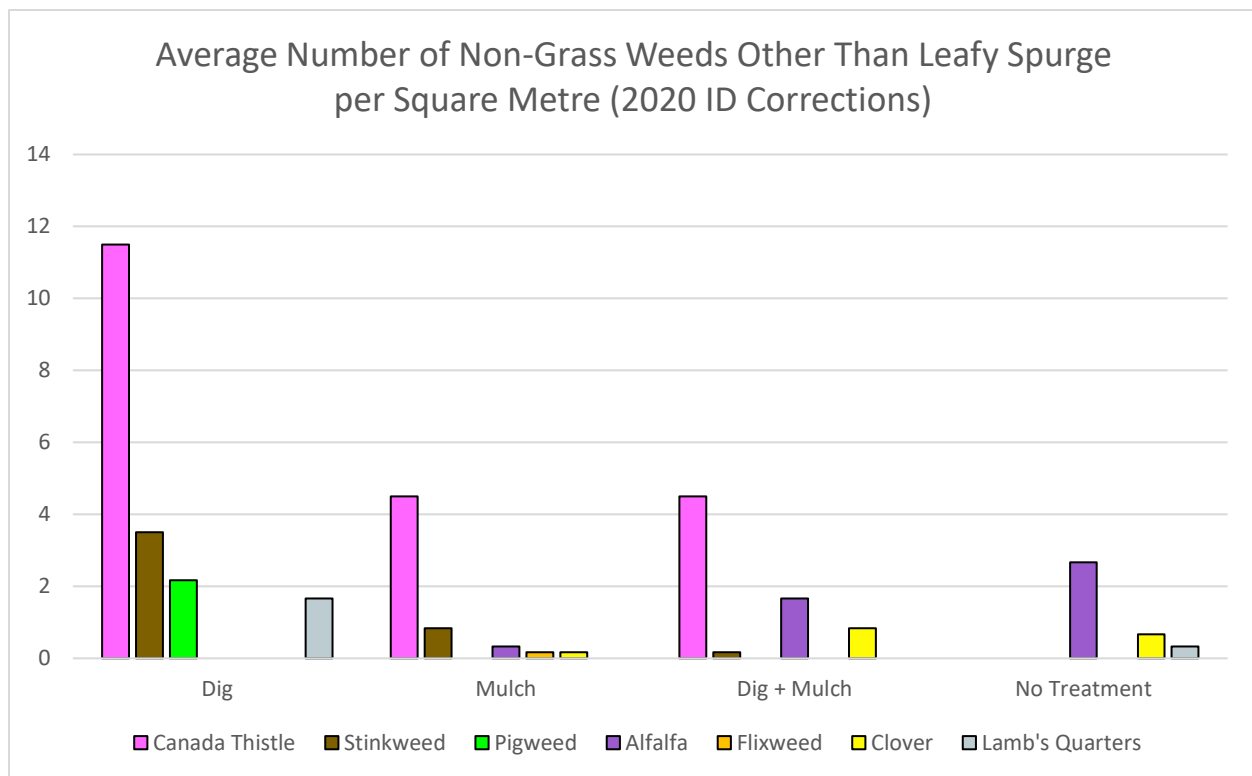


Fig. 5 Number of weeds other than leafy spurge per square meter



Seline Solis and Natasha Rogers with dug-out leafy spurge, July 17, 2018. Photo: Marilou Montemayor



One of the six Dig Only Treatment plots; leafy spurge was controlled considerably but the plot was colonized by Flixweed, Stinkweed and Canada thistle, June 10, 2019. Photo: Brooklyn Neubeker



One of the three No Treatment plots, June 10, 2019. Photo: Brooklyn Neubeker