Case Study: The Mystery of Perennial Pepperweed and Chlorsulfuron in Sierra Valley

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Perennial pepperweed (*Lepidium latifolium*) is one of the most troublesome weeds to control in pastures and riparian areas in California. Throughout the decades, there has been a tremendous amount of effort and research to discover effective methods to control perennial pepperweed. Two products, chlorsulfuron (Telar) and 2,4-D, have been shown to be effective materials where desirable grasses are present. Telar typically offers multiple year suppression of perennial pepperweed with a single application. In the past years, there have been reports from ranchers and land managers in Sierra Valley of Telar not offering effective pepperweed control.

UC Cooperative Extension set out to investigate the issue by setting up a couple of trials in Sierra Valley. The first one in 2019 was over sprayed by the grower, but indicated some effectiveness from Telar. The second trial in 2020 tested two rates of Telar compared to 2,4-D, and surprisingly, only 20-40% suppression of the pepperweed was achieved in the Telar treated plots 12 months after treatments. 2,4-D offered the suppression typically seen for perennial pepperweed in other locations (75%). The study was retreated again in 2020, to make sure an application error had not occurred, but still little effect from the Telar was observed at this site in Sierra Valley, with good suppression from 2,4-D.

The lack of control with an application of Telar is quite curious, and we are still investigating what could have occurred. Telar has been shown to be very effective from research throughout the west, but was not effective in this case study trial. What could be happening? At this point we have two hypotheses. First, there may be some interesting interaction with the unique soils that have very high organic matter (11-12%). Secondly, (and less likely) it is possible herbicide resistance of perennial pepperweed has developed to Telar at this site, which has been treated on several occasions.

UC Cooperative Extension is currently taking the steps to investigate the reason why the pepperweed was not controlled with Telar. We are in the process of growing pepperweed from the Sierra Valley populations and a susceptible pepperweed population at honey lake for a greenhouse experiment to screen for resistance. We will keep you posted on what we learn!

If Telar has not given you control of your perennial pepperweed, consider switching tactics and using another herbicide like, 2,4-D or Glyphosate to control the plants. Please do not hesitate to reach out to Tom Getts (tjgetts@ucanr.edu) for more information.

Percent Pepperweed Control

	12 MAT		24 MAT	
Treatment	Mean	Tukey	Mean	Tukey
2,4-D 2 qt/acre + MSO	77	A	83	A
Telar 1.3 OZ/acre + MSO	28	BC	10	BC
Telar 2.6 OZ/acre + MSO	40	B	28	B
Telar 2.6 OZ/acre + NIS	20	C	7	C
Untreated	0	D	0	C

Visual estimate of control at pepperweed trial in Sierra Valley, 12 months and 24 months after first application. A second application of the same treatments was made to each plot 12 months after the first applications. Letters indicate statistical differences at 95% for Tukey pair wise comparisons.

Perennial Pepperweed in Sierra Valley treated two years in a row at the bud stage with Telar 2.6oz/acre.

Perennial Pepperweed in Sierra Valley treated two years in a row at the bud stage with 2,4-D 2qt./acre.