

CONTROL OF PERENNIAL PEPPERWEED IN WYOMING

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I have worked for Fremont County Weed and Pest since 1975. At that time perennial pepperweed was widespread in the Crowheart area, mostly along the Wind River in Western Fremont County on the Wind River Indian Reservation. A second center of infestation was on the Big Horn River Northeast of Riverton. While this is in the same drainage, the two infestations were not connected and appeared to have originated independently. Records and photos in our files date these infestations to at least the 1940s. The lands infested were mostly wet saline bottom lands along the river. In the Crowheart area, it was common in poorly managed irrigated pasture and hay land. In general, these lands saw limited use for livestock grazing and the impact of the weed was minor. It appeared that these infestations were not expanding and the weed was restricted to these saline sites.

In 1990, we mapped perennial pepperweed on the reservation for the Bureau of Indian Affairs (BIA). That effort disclosed that it was spreading rapidly along irrigation canals in the Crowheart area and was nearly continuous throughout the river bottoms from 20 miles west of Crowheart, to Boysen Reservoir, which is northeast of Riverton. That is about 100 miles of river. We were able to overlay the maps with a soils map for a portion of the infested area. This indicated, that while the weed was spreading, most of the infestation was still confined to high pH, saline soils. The pH ranged as high as 9.2, with the weed growing right to the edge of white alkali patches. We also noted many of the small patches in crop lands where the soil is good. It does not appear to depend on saline conditions; it is just tolerant of them. The completed maps were turned-over to the BIA at the completion of the contract. They were sent off to be digitized for the BIA's GIS, but have been lost. Thus, the objective data on growth of the weed in Fremont County will have to wait for another mapping project. Mapping efforts in Sweetwater County reveal similar site information and that the area infested with the weed has doubled over 20 years in spite of an aggressive spray program.

During the 1990 project for the BIA, observations were made of natural enemies. In the Crowheart area, late season perennial pepperweed becomes the object of attention for ants around the base. It was discovered that the ants were tending a root feeding aphid. Sometimes the ants excavated the soil away from the roots to a depth of 6 inches, leaving the plants loose in the ground. In the Riverton area, perennial pepperweed is attacked by a flea beetle. The two insects were collected, but I am not sure that identification was ever made. There was a high incidence of a white mold, which was identified as common to cole crops. Regardless of natural enemies observed, there was no associated plant injury.

Control efforts for many years with chemicals were only mildly successful. Test plots were maintained for many years examining various products and combinations. The least expensive approach for irrigated hay land was 2,4-D *LV Ester*, applied in spring and fall. Hundreds of acres were treated twice a year in Sweetwater County. The regular use of broadleaf herbicides to control the perennial pepperweed eliminates any legume from the hay, reducing hay quality and yield. *Banvel* provided no stand reduction at rates as high as 8 pounds active

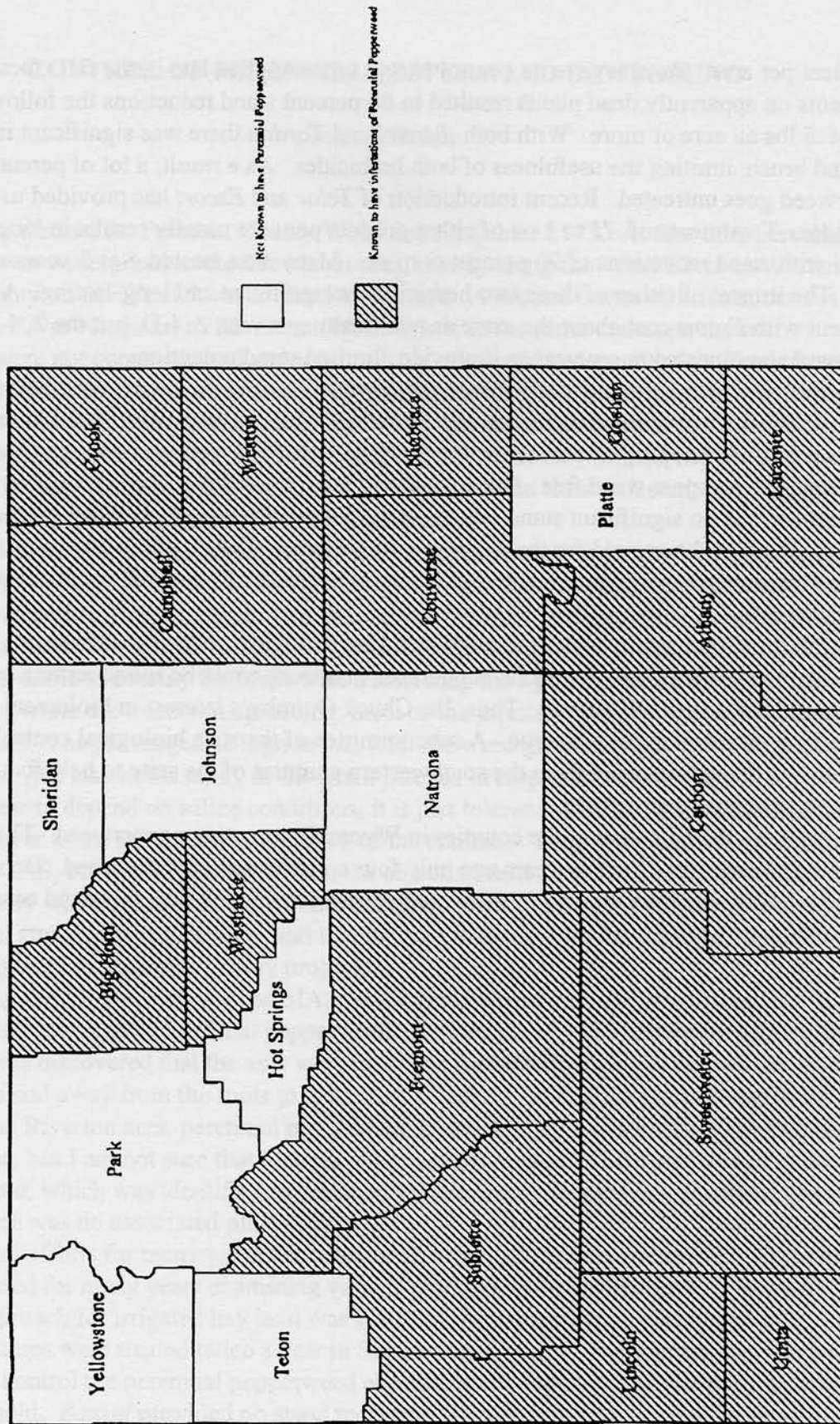
ingredient per acre. *Tordon* gave no control except when applied late in the fall. October treatments on apparently dead plants resulted in 60 percent stand reductions the following year at rates of .5 lbs ai/ acre or more. With both *Banvel* and *Tordon* there was significant injury to trees and brush, limiting the usefulness of both herbicides. As a result, a lot of perennial pepperweed goes untreated. Recent introduction of *Telar* and *Escort* has provided us with useful herbicides. Treatments of .75 to 1 oz of either product per acre usually results in long-term control with stand reductions of 90 percent or more. Many sites treated 4 or 5 years ago are still clean. The impact of either of these two herbicides is significant and long-lasting. A single treatment with *Escort* cost about the same as two treatments with 2, 4-D, but the 2, 4-D treatment will have to be repeated every year as it provides limited stand reduction.

Pastures with perennial pepperweed rapidly become useless to cows and horses. Spread and stand density of the weed increases under grazing, while haying infested fields seems to prevent it from developing into a monoculture. Sheep readily eat pepperweed and even heavily infested pastures appear weed free. Once the sheep are removed the weed comes back. In one pasture there was no significant stand reduction the following year when sheep grazed pepperweed off to the ground for the entire growing season. Digging up a few roots reveals large tuberous rhizomes developing a few inches below the surface. The stored energy reserves must be considerable.

While we are aware of the obstacles faced by biological control, it still seems prudent to investigate the possibilities. Financial support for that work could be found among county weed districts and the state of Wyoming. Thus, Dr. Chuck Quimby's interest in biological control of the weedy mustards is most welcome. A subcommittee of the state biological control steering committee is being organized from the southwestern counties of the state to help focus our efforts on perennial pepperweed.

I am enclosing a map of the counties in Wyoming reporting pepperweed. The total is now 16 of 23 counties. Twenty years ago only four counties reported the weed. Depending on who is counting, and how they do it, there are between twenty and fifty thousand acres infested.

Presence/Absence



Map by Klana Rogers August 9, 1996 Cooperative Agricultural Pest Survey (CAPS) Dept. of Plant, Soil and Insect Sciences University of Wyoming