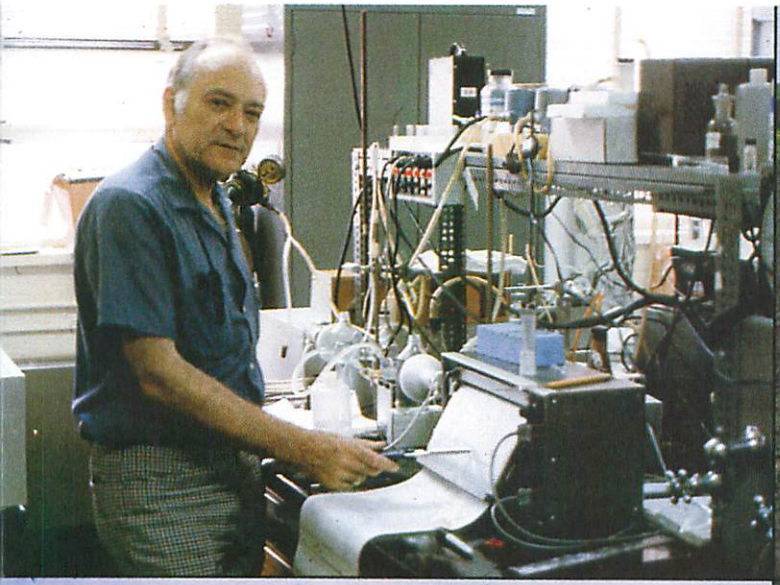
WEEDS TODAY

VOLUME 10, NUMBER 4 SERVING WEED CONTROL PROFESSIONALS WINTER 1979



FEATURING· USDA WEED SCIENCE RESEARCH

Non-Profit Organization
U.S. POSTAGE
PAID
Ft. Worth, Texas

Rangeland Weed Control, by Howard L. Morton, Tuscon, Arizona

There are approximately 808 million acres of rangeland in the 17 western states. This land area is not only immense, it is also diverse. There are 23 major vegetation types within this resource with numerous range sites within each type. SEA-AR scientists are conducting research on the control of weeds primarily in 14 of these vegetation types, which range from arid Southwestern shrub-steppe and desert shrub to the humid mountain meadows and mountain grasslands. Weed problems on western rangelands include *annual grasses* such as downy brome, medusahead, Japanese bromegrass, and red threeawn; *poisonous plants* such as halogeton, tall larkspur, timber milkvetch, locoweed, and western false hellebore; *herbaceous broadleaf plants* such as yellowstar thistle, diffuse and spotted knapweeds, scotch thistle, and Dalmation toadflax; and *woody plants* such as sagebrush, juniper, mesquite, oak, rabbitbrush, and creosotebush.

The purpose of this research is to develop reliable, economical, and safe methods for control of unwanted plant species on rangelands so that the quantity and quality of forage for domestic and game animals is improved, the aesthetic value of areas used for recreation is enhanced, soil is protected from wind and water erosion, and livestock losses due to poisonous plants are reduced.

Annual Grasses

One of the most difficult problems confronting range managers was the establishment of forage plants in arid environments dominated by downy brome. Not only is moisture often limiting during critical stages of growth, but this rapidly growing annual weed competes for moisture, light, space, and nutrients.

SEA-AR scientists Raymond Evans, Richard Eckert, and James Young, working at Reno, Nevada, have developed a chemical fallow technique to control downy brome and establish wheatgrasses on infested ranges. Atrazine is applied in the fall to kill downy brome seedlings. The residual atrazine prevents reestablishment of the downy brome for one year, and the next fall wheatgrasses are planted with a deep furrow drill. The wheatgrasses are able to grow on the site because of reduced competition from downy brome and the soil moisture conserved from the fallow.

With this research, techniques have been developed for converting degraded, low producing, highly erodable rangeland into stable rangeland which is able to provide the resources needed by a viable livestock industry, abundant wildlife, and adequate recreation.

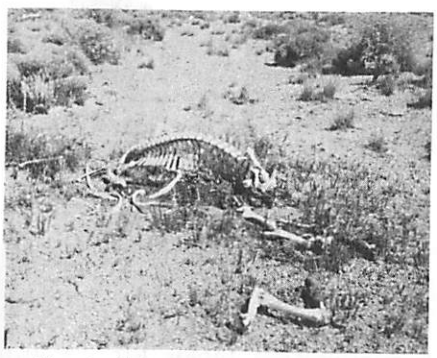


Fig. 1. Halogeton and other poisonous plants cause economic losses of about $107 million annually on western rangelands.

Broadleaf Weeds

SEA-AR scientists W. C. Robocker, C. L. Canode, and R. D. Schirman, working at Pullman, Washington, developed effective herbicidal treatments for the control of swainsonpea, yellow starthistle, dalmation toadflax, diffuse and spotted knapweeds, witchgrass and western bracken. These low value plants compete with forage plants and lower the quantity and quality of forage. While chemical control of all these weeds is not practical on large areas, small infestations can be controlled, and the continued spread of these weeds can be checked.

Poisonous Plants

Effective herbicidal control measures, using 2,4-D or 2,4,5-T, have been developed for control of tall larkspur, timber milkvetch, western false hellebore, spring parsley and halogeton by SEA-AR scientists Eugene Cronin and Coburn Williams who work at the Poisonous Plant Research Laboratory (PPRL), Logan, Utah. The control measures involve the proper timing and dosage rates of the herbicides. In addition, the scientists study the integrated management of grazing livestock so that death losses can be prevented and forage utilized on areas which were formerly unuseable because of the threat of poisoning to grazing animals.

Scientists at the PPRL have identified the poisonous principles in timber milkvetch, spring parsley, approxiamtely 50 species of *Astragalus*, lupine and poison hemlock. Recently Dr. Williams, cooperating with Mexican scientists at Rancho Experimental La Campana, Chihuahua, found that the toxic principle in alfombrilla is a group of saponins. While alfombrilla is not found in the United States at this time, it is growing very close to Arizona and New Mexico and in northern Sonora and Chihuahua where it is causing severe death losses for the Mexican livestock industry. H. M. Hull and H. L. Morton, working in greenhouses at Tucson, Arizona and in field plots in northern Mexico, have found that picloram applied at 1 kg/ha gives excellent selective control of alfombrilla, and picloram or tebuthiuron at rates of 3 kg/ha gives non-selective control of alfombrilla for at least three years.

Woody Plants

SEA-AR scientist Thomas N. Johnsen, Jr., working in northern Arizona, found that pelleted formulations of picloram, karbutilate, or tebuthiuron applied at rates of 1 to 4 lb/A will control junipers and shrub live oak. He found that killing the juniper overstory with picloram, karbutilate, or tebuthiuron eliminated the snakeweed successional stage. Within five years after killing the juniper overstory with herbicides, forage production increased from 50 to 2800 lb/A without seeding. Similar responses occurred with chaparral but seeding with grasses was necessary.

Dr. Johnsen measured a 65% increase in water yield after a juniper watershed was treated with picloram. During a three-year period after application of picloram to the watershed, only 1.3 percent of the picloram moved off the treated area in runoff water. And traces of picloram were barely detectable in the soil the fourth year after treatment.

When Dr. Carlton Herbel applied 2,4,5-T aerially to honey mesquite-infested sand dune sites on the Jornada Experimental Range, the mesquite was controlled, the dunes leveled, wind erosion was virtually eliminated, and the interdunal spaces were occupied with mesa dropseed and other forage grasses. Similar increases in ground cover and forage plants with accompanying decrease in soil erosion have been recorded by Howard Morton, Leonard Lane, and Kenneth Renard on rangeland watersheds in southern Arizona.