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SPOTTED LOCOWEED ON THE HENRY MOUNTAINS

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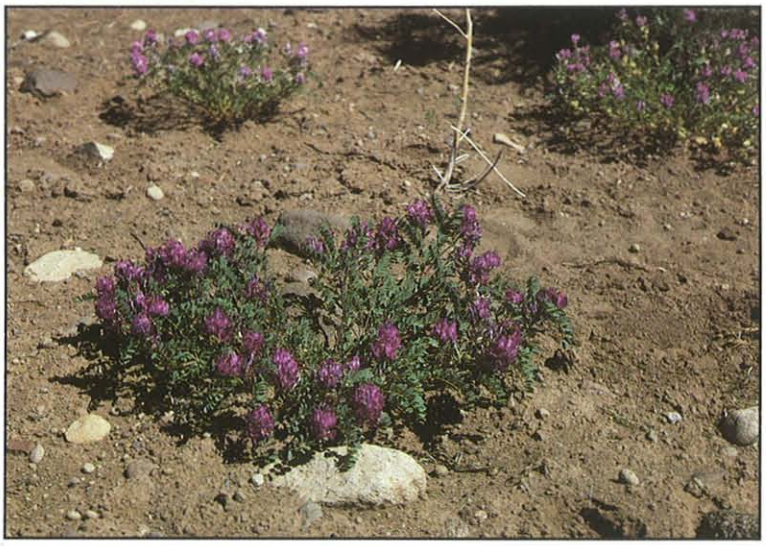

INTRODUCTION

Spotted locoweed (*Astragalus lentiginosus*, var. *wahweapensi*) also known as freckled or Wahweap Milkvetch is characterized by blue leguminous flowers, purple speckled seed pods, and leaves resembling those of garden pea. The plant is poisonous to cattle, sheep and horses. It grows on gravely clay loam semidesert benches and swales supporting desert shrubs and sparse stands of juniper.

CYCLIC NATURE OF SPOTTED LOCOWEED

Spotted locoweed is classified a perennial by plant taxonomists, but the plant seldom survives beyond the second or third growing season. Plants often persist as winter biennials, in that they germinate following late summer or autumn rains; go dormant during the winter, resume growth in early spring, then flower and set seed. Without abundant spring and summer precipitation, these plants fail to survive another year (Welsh 1988).

In a study of the population cycles of spotted locoweed on the Henry Mountains in southeastern Utah (Ralphs & Bagley, 1988), population outbreaks were documented to occur every 6 to 8 years (Figure 1). Correlation of outbreaks of spotted locoweed with weather records suggests that abundant spring precipitation must follow a wet fall to produce a spotted locoweed population outbreak.

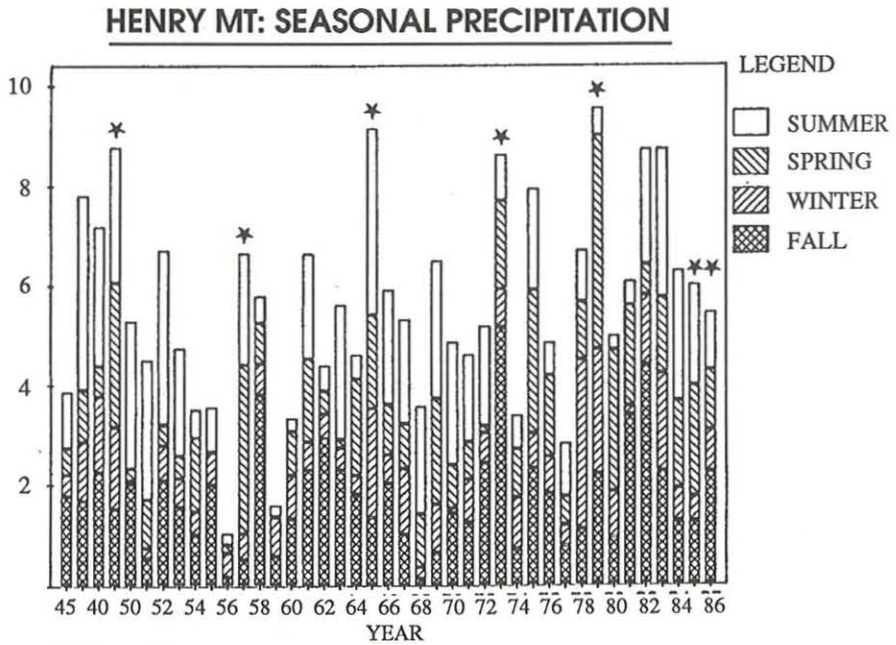

Figure 1

Seasonal precipitation (expressed on a water year basis) and the years that Spotted Locoweed outbreaks occurred (*).

Spring precipitation was above average every year spotted locoweed outbreaks were documented.

LIVESTOCK GRAZING

Ranchers and researchers have observed that livestock avoid grazing green succulent spotted locoweed in the spring and summer, but readily graze the dead or senescent stems during subsequent winters.

A winter grazing study on the foothills of the Henry Mountains (Ralphs et al. 1988) documented that cattle will graze the dead senescent stalks of spotted locoweed whenever it is available. It comprised 24% of cattle diets when cattle grazed gravelly benches where locoweed was abundant (Table 1).

Cattle preferred to graze cool-season grasses (Indian Ricegrass and Squirreltail), but as the supply of these grasses diminished, cattle increased consumption of spotted locoweed, galleta grass and shadscale. Consumption of spotted locoweed also increased during periods when snow covered the low growing grasses (Figure 2).

Inexperienced cows (not exposed to spotted locoweed previously) consumed slightly more spotted locoweed than did cows that had previously grazed locoweed-infested rangeland. Only the inexperienced cows exhibited clinical symptoms of locoweed poisoning: depression, solitary grazing habit, excitable when stressed, and waterbelly. One of the experienced cows aborted.

NUTRITIONAL ANALYSIS

The old dry stalks of spotted locoweed were nutritionally superior to other associated forage plants (Table 2). Crude protein (CP) levels of 1- and 2-year old senescent locoweed plants were higher than for other forages from the same site. Digestible organic matter (IVOMD) or energy from spotted locoweed was similar to dry grasses. Though spotted locoweed provided more energy and protein than dry grasses, we observed no difference in preference between locoweed and galleta grass.

Swainsonine, is the toxic alkaloid in true locoweeds. Swainsonine appears to remain stable in dry and senescent spotted loco stems (Table 2). Swainsonine was only slightly lower in old black locoweed than in new green vegetative growth collected in the spring of 1987. Researchers suggest that as organic matter decomposes in the senescent stems, swainsonine may become more concentrated in the residual plant material. In theory, the older stems would then become more toxic as decomposition progresses. The concentration of swainsonine in green succulent plants may also vary from one year to another.

POISONING

Livestock losses to locoweed can be devastating to ranchers. However, death of the animal may be less common than other more subtle losses, i.e. abortion, weight loss, failure to breed back and reduced weight gains. Since cattle on open range are more solitary than sheep and are not herded daily, the symptoms of locoism may not be readily observed. Signs of locoism become apparent as affected animals are handled or herded. Pronounced symptoms of loco poisoning are: loss of muscular coordination, weakness, nervousness, stumbling gait, blinking eyes and a tendency to charge handlers and push against corral walls or fences. In extreme cases the outcome is death by starvation or dehydration. Swainsonine is excreted in the milk, thus calves of affected cows also become intoxicated and are often retarded, unable to suckle, or unable to stand.

MANAGEMENT RECOMMENDATIONS

Because the early stages of locoism are difficult to identify, ranchers should frequently ride among the grazing animals and look for signs of poisoning. The herding and stressing of intoxicated animals will often cause the symptoms to be more pronounced and discernible. Cattle should be taken from the range when the first signs of locoism or behavior change are noticed.

Spotted locoweed is most abundant on the gravelly benches surrounding the Henry Mountains. It is less frequent on sandy sites and does not grow on clay sites. Thus, it may be feasible to keep cattle off areas where spotted locoweed is abundant until after green forage is available in the spring. It may be necessary to alter the sequence in which pastures are grazed, or herd cattle into other areas of the allotment until spring greenup.

Another alternative may be to concentrate a large number of livestock on dense stands of locoweed at the beginning of the grazing period, to rapidly remove the loco crop before any one animal consumes enough to become intoxicated.

New or inexperienced cattle should not graze infested ranges during seasons when the loco plants are abundant and easily grazed.

Literature Cited

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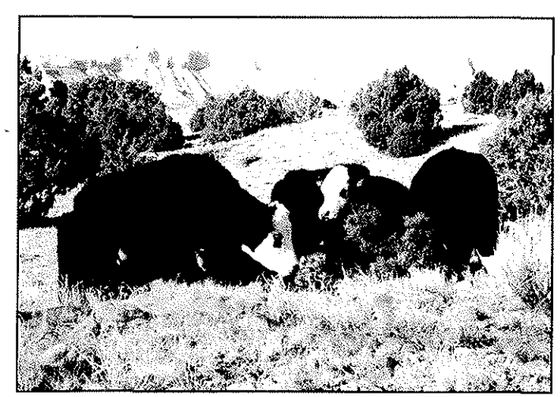
Table 1.

Standing crop of forage classes and their percent in cattle diets on four ecological sites on Henry Mountain winter range.

Forage Class	Bench 1) Standing Crop	Bench 1) % of Diet	Swale 2) Standing Crop	Swale 2) % of Diet	Clay 3) Standing Crop	Clay 3) %of Diet	Creek Bottom Standing Crop	Creek Bottom % of Diet	Average % of Diet
	lb/ac	%	lb/ac	%	lb/ac	%		%	%
Grass	112	65	131	55	15	15	--	65	52
Forb	12	2	71	8	0	1	--	2	2
Shrub	126	9	90	20	418	83	--	40	31
Spotted Locoweed	111	24	49	8	0	1	--	1	15

1) Semi-desert stony clay loom ecological site with gravel and cobble outcropping.
2) Semi-desert sandy loam ecological site with sparse juniper overstory.
3) Desert clay ecological site dominated by Gardner and mat saltbrush.



Cattle grazing dry locoweed stocks during winter

LOCOWEED IN CATTLE DIETS

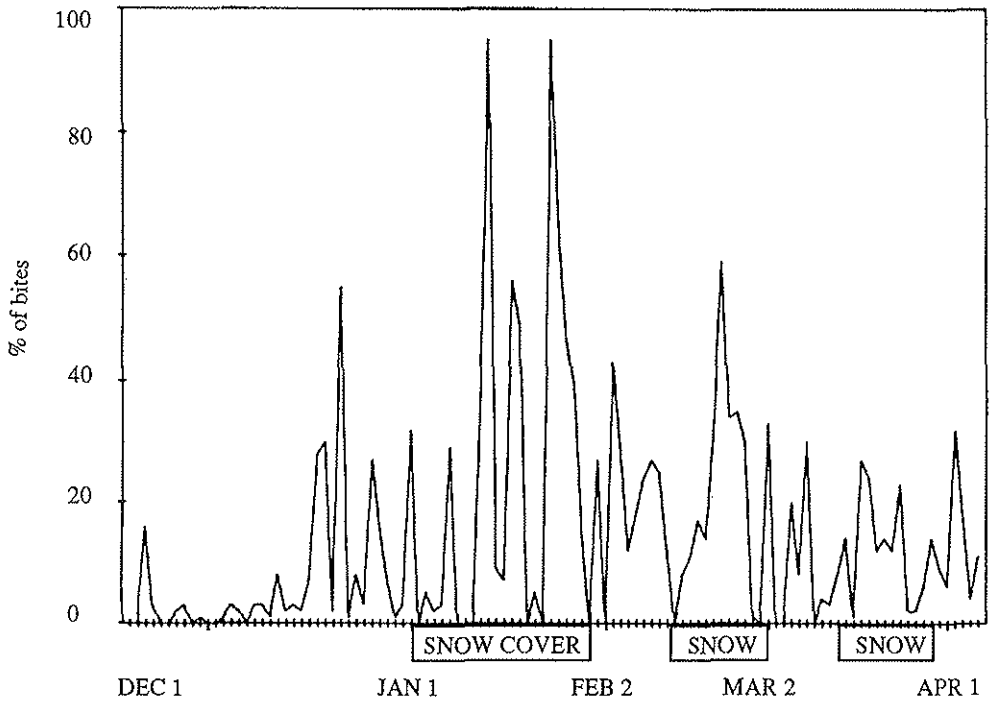


Figure 2

Daily amount of locoweed in cattle diets (% of recorded bites) throughout the 5 month study on desert winter range on the Henry Mountain.

Table 2

Chemical Composition of Locoweed and Other Forage on Henry Mountain Winter Range (Percentage of Organic Matter)

Species	Stage of Growth	Swainsonine	CP	IVOMD[a]
Spotted Locoweed	Black 1985	.023	10.9	48
	Dry 1986	.005	6.8	54
	Green 1987	.037	11.7	63
Stinking Milkvetch	Green 1986	.019		
Grass				
Galleta	Senescent		1.8	39
Indian ricegrass	Senescent		3.1	47
Squirreltail	Green regrowth		5.3	66
Shrubs				
Shadscale	Evergreen		3.8	45
Gardner saltbrush	Evergreen		4.9	56
Mat saltbrush	Evergreen		5.3	61

[a]CP = crude protein, IVOMD = in vitro organic matter digestibility.

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