Snakeweed

Guterrezia sarothrae - >3 floretes/head (Broom snakeweed)

G. microcephala - 1 florete/head (Threadleaf snakeweed)

Other common names: tuprentine weed, slinkweed, matchweed, rubberweed, yellowtop, broomweed

Snakeweed History of Poisoning

- Ranchers in southern Great Plains suspected broomweed poisoning
- West Texas – abortions 10-60%
- Research
  - Schmidt 1931 – no toxicity
  - Matthews 1936 – toxic to cattle sheep goats
  - Dollahite 1957 – low dose cause abortions, high dose toxic
- Chemistry
  - Shaver 1964 – Saponin caused abortions
  - Roitman 1985 – flavonids likely estrogenic
  - Roitman 1994 – Diterpene acids, similar to ICA in pines
    - Relative amount of individual acids toxic or abortifacient

Clinical signs of Poisoning

- Abortions
  - Small weak calves
  - Retained placenta
  - Infection causing death

- Toxic syndrome
  - Anorexia
  - Mucopurlent nasal discharge
  - Listlessness
  - Loss of appetite
  - Diarrhea
  - Constipation
  - Rumen stasis
  - death

Relationship of Snakeweed Poisoning to Nutrition NMSU

Smith 1991 – snakeweed in rat diets reduced fertility and increased fetal mortality.

Edrington 1993 – snakeweed reduced intake, but impaired hormone balance disrupted blood flow to uterus leading to fetal death.

Oetting 1991 – snakeweed in low quality diets reduced intake and ewes didn’t show estrus.

Williams 1993 – snakeweed in balanced diet didn’t affect estrus, conception, or cause abortions in heifers.

Poisoning = starved animals forced to graze snakeweed

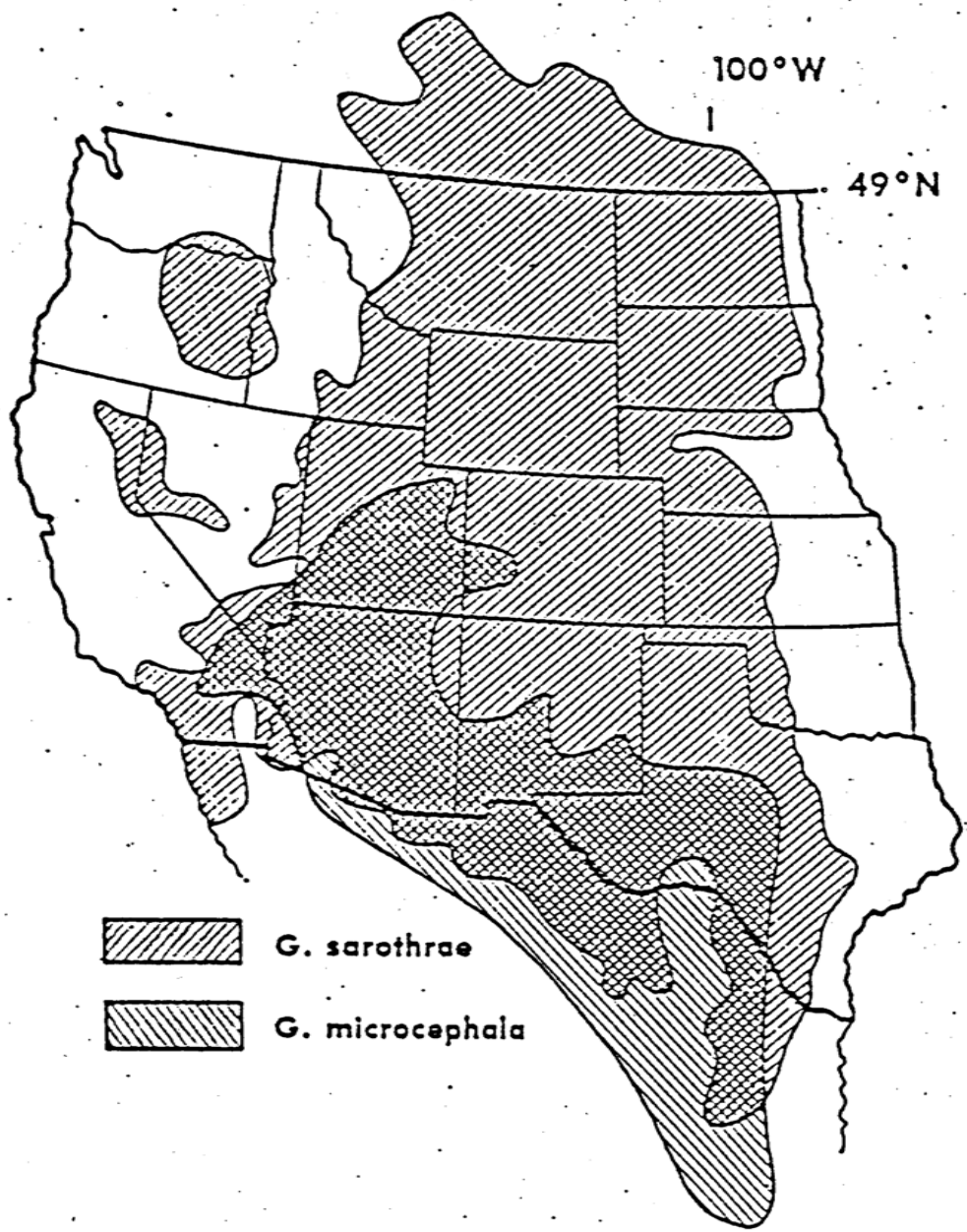
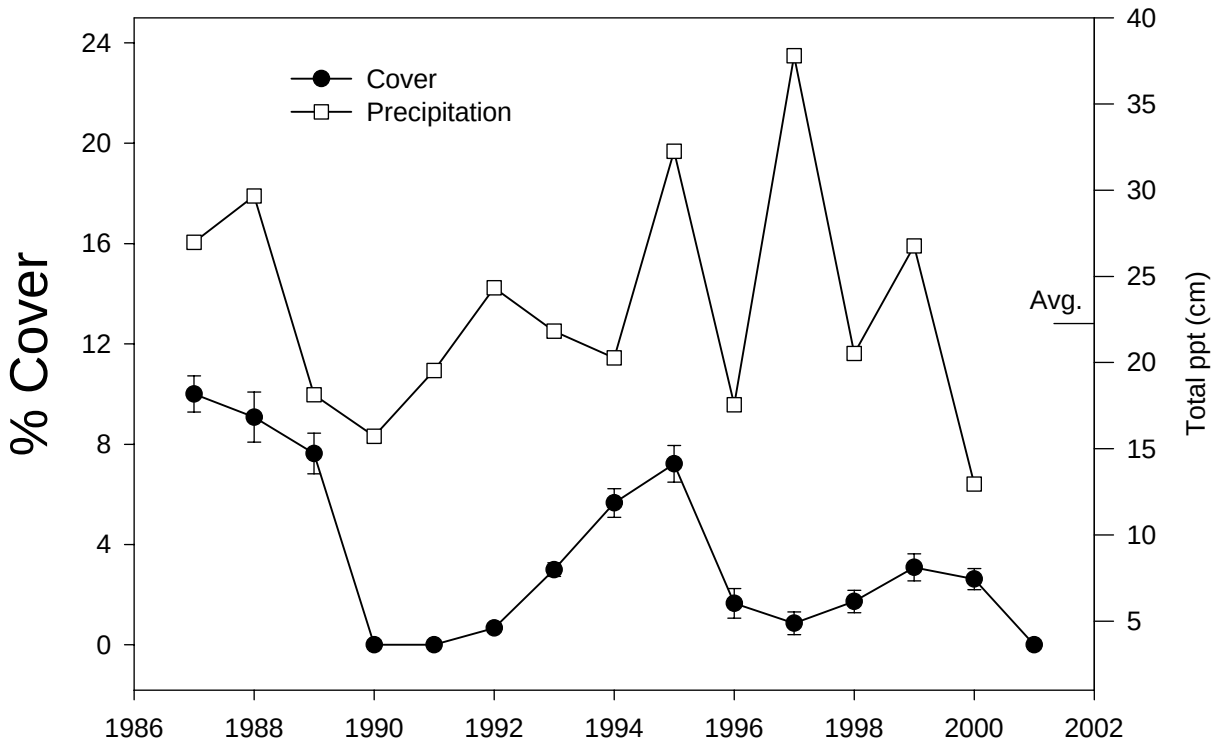


FIG. 8.2 Distribution of *Gutierrezia sarothrae* and *G. microcephala* in North America (adapted from Lane 1985).

Snakeweed Cover

Ferron Utah



Snakeweed Competition

Grass Production	no snakeweed	with snakeweed
Shortgrass prairies	800 lb/ac	80 lb/ac
Desert grassland		

Snakeweed Cover	Climax / PNC	Current
Salt-desert shrub		
Henry Mt	5%	13%
Ferron UT	3%	10%
Sagebrush steppe	5%	14%
Pinyon / Juniper	0%	4-5%
	(total foliar cover = 20%)	

Snakeweed Competition

1. Prolific seed producer 1200-22,000 seeds/plant

2. Seed germination
   a. Seeds on surface - 70% germination - establish when conditions favorable
   b. Buried seeds - low germination - reserve for long-term survival

3. 2-tier root system
   a. Deep tap root
   b. Extensive adventitious roots

   Exhaust soil moisture from entire soil profile

4. Leaves - little stomatal control - luxuriant use of water
   a. Shed leaves in drought
   b. Stem photosynthesis to maintain plnt

5. Allelopathy - saponins and flavonoids
   suppress grass root growth

6. Even-aged stands - near total dominance
   a. Cataclysmic event - population dies (drought, fire, insects)
   b. 1st to germinate and establish when adequate moisture
   c. Intraspecific competition - 70% seedlings die in first year
   d. Interspecific competition - crowd out grass
      1. Soil moisture depletion
      2. Allelopathy

Conditions of Poisoning

Snakeweed is not palatable

- High levels of saponins, flavonids, terpenes (crude resins 13%)

Grazed only when desirable forage depleted

- Winter and early spring –
  - warm season grasses dormant, snakeweed 1st to grow.
- Overgrazed ranges.

Magnitude of Losses (Torell 1988)

Eastern New Mexico, West Texas - $44.3 million

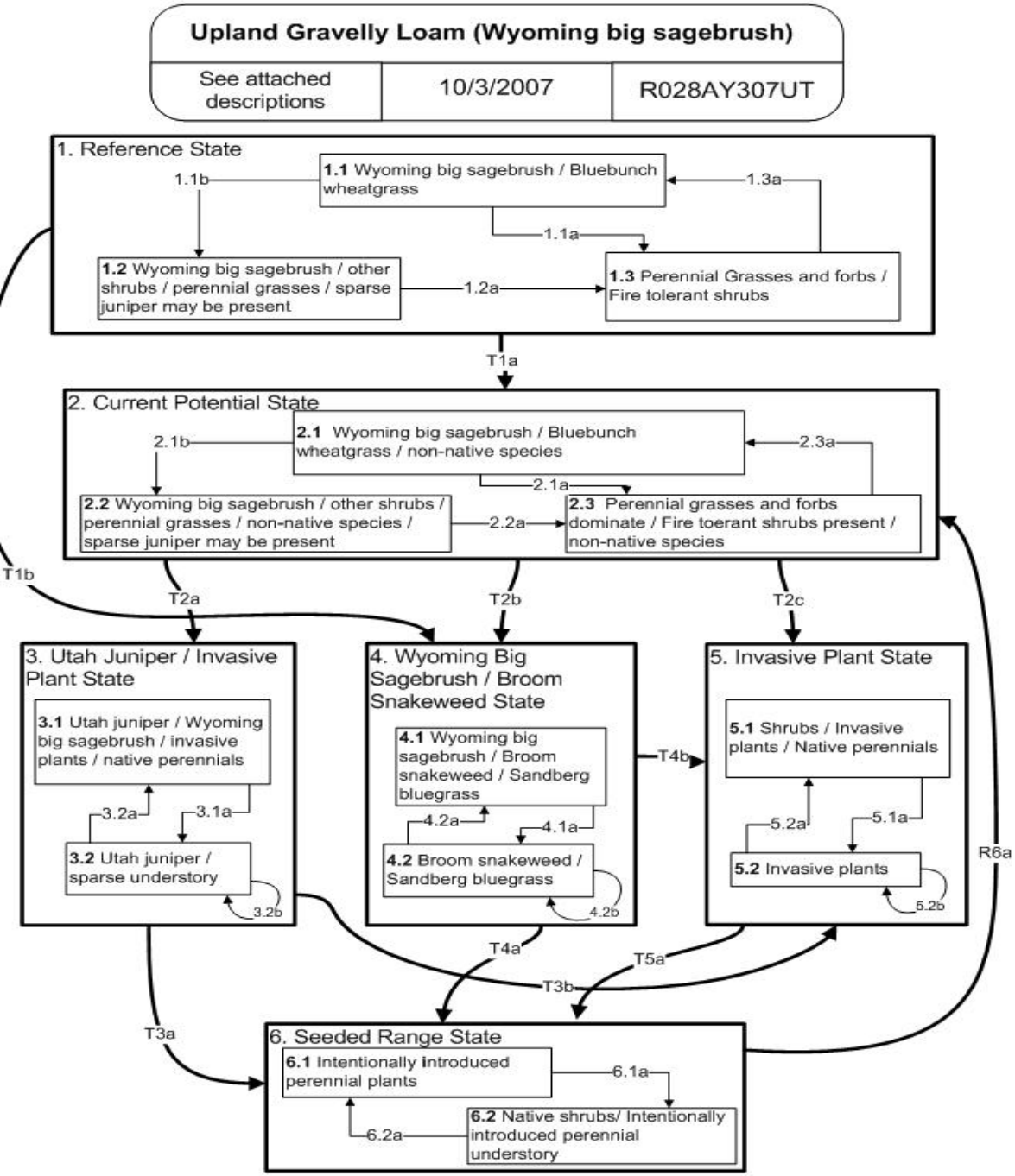
- Reduced forage production
  - Biggest impact, 72% of total loss
- Death and abortions
  - Abortions 2.9% of calf crop
  - Death rate – 1% annually
- Decreased gains

Management to reduce poisoning

- Ensure adequate feed.
- Control
  - Mechanical – plow and seed to adapted grass
  - Prescribed burning
  - Herbicide

Herbicide	Rate	Spring	Fall	$/ac
2,4-D	2lb/ac	25%	0	4
Escort	3 oz/ac	23	78	7.50
	6 oz/ac	72	87	15
Tordon	.5 lb/ac	97	98	23
Grazon PC	.25 lb/ac			9.40

Cool-season grass competition with snakeweed


Upland Gravelly Loam (Wyoming big sagebrush)
See attached descriptions
10/3/2007
R028AY307UT
1. Reference State
1.1 Wyoming big sagebrush / Bluebunch wheatgrass
1.1b
1.3a
1.1a
1.2 Wyoming big sagebrush / other shrubs / perennial grasses / sparse juniper may be present
1.2a
1.3 Perennial Grasses and forbs / Fire tolerant shrubs
T1a
2. Current Potential State
2.1 Wyoming big sagebrush / Bluebunch wheatgrass / non-native species
2.1b
2.3a
2.1a
2.2 Wyoming big sagebrush / other shrubs / perennial grasses / non-native species / sparse juniper may be present
2.2a
2.3 Perennial grasses and forbs dominate / Fire toerant shrubs present / non-native species
T1b
T2a
T2b
T2c
3. Utah Juniper / Invasive Plant State
3.1 Utah juniper / Wyoming big sagebrush / invasive plants / native perennials
3.2a
3.1a
3.2 Utah juniper / sparse understory
3.2b
4. Wyoming Big Sagebrush / Broom Snakeweed State
4.1 Wyoming big sagebrush / Broom snakeweed / Sandberg bluegrass
4.2a
4.1a
4.2 Broom snakeweed / Sandberg bluegrass
4.2b
T4b
5. Invasive Plant State
5.1 Shrubs / Invasive plants / Native perennials
5.2a
5.1a
5.2 Invasive plants
5.2b
R6a
T4a
T5a
T3b
T3a
6. Seeded Range State
6.1 Intentionally introduced perennial plants
6.1a
6.2a
6.2 Native shrubs/ Intentionally introduced perennial understory