

2001

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Holman, Tom; Reece, Patrick E.; Rush, Ivan G.; and Baltensperger, David, "NF584 Strategies for Range Beef Cattle Producers in Arid Environments Following Drought" (2001). *Historical Materials from University of Nebraska-Lincoln Extension*. 108.
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Strategies for Range Beef Cattle Producers in Arid Environments Following Drought

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Precipitation can be below average for much of the Nebraska Panhandle and adjoining areas for prolonged periods. Prolonged drought results in an inadequate supply of forage for hundreds of thousands of beef cattle on millions of acres of rangeland. While some variation occurs among ranches and among pastures within a given ranch, all rangeland vegetation in arid environments like western Nebraska can be moderately to severely damaged by drought stress and/or excessive grazing. Consequently, even if soil moisture is not limited in the years following a drought, spring growth rate will be reduced and total annual forage production can be 20 to 50 percent below average on millions of acres of rangeland.

Growth of below-ground plant parts in grasses is proportional to the amount of top growth each year. Combinations of drought-limited plant growth and/or excessive livestock grazing have dramatically reduced root growth, levels of stored energy, and formation of buds needed for future-year tillers. In addition, the remaining plant cover is insufficient to keep rain water from evaporating or running off the soil surface. Reduced precipitation efficiency and reduced depth and total length of roots will make it impossible for most rangelands in the region to produce average levels of forage in the year following the drought even with above average precipitation.

Stocking rates following drought must be reduced at least 20 to 50 percent compared to long-term average pair-days per acre because a larger percentage of the drought year's plant growth should remain ungrazed to improve the effectiveness of precipitation. In the long run, it will be most cost effective to defer grazing in severely damaged pastures

for a full growing season, until after a killing frost or until the following summer.

Failure to delay turnout and reduce stocking rates in the year following a drought would be a serious tactical mistake for long-term ranch survival. Stocking rate reductions in the Nebraska Panhandle and adjoining arid regions should include delaying use of summer pasture until June 15 on Sandhills rangeland or until June 1 on other rangeland. The greatest number of cow-days per acre will be obtained when pastures are not grazed until plants have completed most of their growth for the year. When feed and/or planted forages are used to minimize herd reductions, keep all cattle off rangeland during the spring and into the summer to allow unimpeded plant growth.

Safe stocking rates for animal performance and plant vigor on upland range sites in the Nebraska Panhandle or Sandhills, with average or above average rainfall in the year following drought, will vary from 5 to 10 animal unit days (AUD) per acre (0.17 to 0.33 AUM/ac) during the summer grazing season. Estimate animal unit equivalents by dividing average animal weight by 1,000 lbs. Add the weight of calves to the cow weight and divide by 1,000 lbs when the average age of the calf crop is three months or older. For example, the estimated animal unit equivalent for 1100 lb cows with four-month-old, 350 lb calves is 1.45. At six AUD/acre, each acre would provide about four pair-days of grazing for the summer grazing season. Continuation of drought, especially below average precipitation during May and June, will eliminate opportunities for safe summer grazing on all pastures with limited plant cover.

Because of the damage already done to plants by the drought, reduce livestock use of range grasses following drought regardless of late winter and spring moisture. Cattle producers will need to plan for much lower stocking rates on upland pastures for the year immediately following drought and possibly the following year.

To maintain cow numbers similar to long-term average levels, consider irrigated and/or dryland crop forage alternatives listed below. Sections relate to irrigation, availability of tillable land and spring rainfall amounts. In all herds, early weaning calves, culling deeper into the cow herd and no retention of heifers will reduce dependence on feed resources or seeded forages.

Replacement Feed and Forage Alternatives

No Irrigated or Dryland Tillable Ground Available for Annual or Perennial Forages

A. When annual precipitation following drought years is less than 4 inches by May 1.

- Move cows to dry lot.
- Buy hay, corn or other feed stuffs (see *Table I*).
- Do not use upland range.
- Do not feed on upland range.
- Rent wheat pasture
- Relocate cattle to leased pastures outside the drought area.

Table I. High concentration ration (lbs/head/day)*

	<i>Corn</i>	<i>Alfalfa Hay (15% CP and 55% TDN)</i>	<i>Very Poor Quality Forage</i>
Middle 1/3 of pregnancy and calves weaned	4	11	5
Last 1/3 of pregnancy	4	12	5
Lactation	6	15	5

*These rations will not satisfy a cow's appetite so they will act and appear hungry and underfed. Adding more very poor quality roughage (4.5 CP and 43 percent TDN) will satisfy cows but will add cost. Provide 3 feet of bunk space per cow and feed twice a day. A supplement should be added that provides around 200 mg of an ionophore daily.

B. When precipitation is 4-6 inches by May 1.

- Delay turnout:
 - with Sandhills and other warm season rangelands — until after June 15;
 - with other range — until after June 1.
- Reduce stocking rates by 30-50 percent.
- Flash graze (heavy stocking density for very short periods) cheatgrass to gain early grazing days. This requires excellent management and removing cattle as desirable cool season or warm season grasses emerge.
- Rent CRP — may need to supplement protein.

C. When precipitation is more than 6 inches by May 1.

- Delay turnout:
 - with Sandhills and other warm season range lands — until after June 15;
 - with other range — until after June 1.

- Reduce stocking rate by 30-50 percent.
- Flash graze (heavy stocking density for very short periods) cheatgrass to gain early grazing days. This requires excellent management and removing cattle as desirable cool or warm season grasses emerge.

Irrigated Land Available

A. Limited irrigation water.

- Plant wheat, rye or triticale February 15 to March 15.
 - Seeding rate: 112-120 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 2000 lbs dry matter/acre
 - Graze 40-50 days after planting (6-inch growth).
 - Do not expect grain yield.
- Plant spring small grains March 15 to April 30.
 - Seeding rate: cereals same as above
 - oats 64 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 2000 lbs dry matter/acre
 - Graze out 40-50 days after planting (6-inch growth).
- Plant warm season annuals (pearl millet, haygrazer, sorghum-sudan) from May 15 to July 15.
 - Seeding rate: pearl millet 10 lbs/acre
 - sorghum-sudan and haygrazer 20 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 4000 lbs dry matter/acre

B. Average irrigation water available.

- Plant wheat, rye or triticale February 15 to March 15.
 - Seeding rate: 180 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 3000 lbs dry matter/acre
 - Graze 40-50 days after planting (6-inch growth).
- Plant cereal grains, turnips or oats April 15 to April 30.
 - Seeding rate: cereals 180 lbs/acre
 - oats 69 lbs/acre
 - turnips 2-5 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 3000 lbs dry matter/acre
 - Graze 40-50 days after planting (6-inch growth).
- Plant warm season annuals (pearl millet, haygrazer, sorghum-sudan, corn)
 - Seeding rate: pearl millet 20 lbs/acre
 - haygrazer and sorghum-sudan 25 lbs/acre
 - corn 40 lbs/acre
 - Fertilize according to soil test recommendations.
 - Production: 6000 lbs dry matter/acre

Tillable Dry Land Available

A. Less than 3 inches of rain January - April.

- Move cows to dry lot.
- Rent wheat pasture.
- Buy hay or other feed stuffs.
- Plant wheat, rye, triticale or oats.
 - Seeding rate: 112-120 lbs/acre (oats: 64 lbs/acre)

- Production: 500 lbs dry matter/acre
- Graze 40-50 days after planting (6 inch growth).
- Do not use upland range.
- Do not feed on upland range.

B. 3 - 5 inches rain by May 1.

- Rent CRP — may need to supplement protein.
- Delay turn out:
 - with sandhills and other warm season range lands — until after June 15;
 - other range — until after June 1.
- Reduce stocking rate by 30-50 percent.

C. Relatively abundant June moisture.

- Plant warm season annuals (pearl millet, haygrazer, sorghum-sudan, corn)
 - Seeding rates: pearl millet 10 lbs/acre
sorghum-sudan and haygrazer 20 lbs/acre
- Fertilize according to soil test recommendations.
- Production: 1000 lbs dry matter/acre

Frequently Asked Questions

Can I graze winter wheat and still get a grain crop?

Yes, provided cattle are removed at early boot stage, grain yield will be 65 percent of normal. If cattle are removed at jointing, there will be very little yield loss.

What is the best use of irrigation water — cool or warm season grasses?

Cool season grasses will respond best to fertilizer and water.

Irrigated Pastures

Seeding and establishment — Spring seeding following a drought is difficult if subsoil moisture has been depleted.

What species do well in a very limited irrigation water situation (6-8 inches)?

- Perennials: intermediate wheat grass
pubescent wheat grass
cicer milk vetch
switch grass*
- Annual forages: spring and winter cereals, pearl millet,
and low prussic acid sorghum-sudan.*

How much residue/stubble can there be on the field when seeding?

As much as a grass drill will tolerate.

Is spring or late-summer/fall seeding better?

Late summer seeding results in less weed pressure and less lost production time.

Is cross-drilling helpful in obtaining a thicker stand?

*No, if narrow rows are possible.
Yes, if rows are over 8 inches.*

What type of drill works best? Where can I find a grass drill to use?

*Grass drills with seed agitator, depth control bands and press wheels.
Seed dealers and NRD's usually have one to lease.*

Is it advisable to seed grasses directly into native range?

No, seedlings can not compete with established plants.

Is it advisable to mix cool and warm season species together?

No, it is very difficult to establish and manage for growth, fertilizer application, weed control and water use.

What weed species may be a problem?

Kochia, pigweeds, thistles, ragweed, downy brome and sandbur

Irrigation

Will eroding pivot tracks be a problem?

Yes, unless graveled.

Can I irrigate over cattle if I need to?

Yes, except when soils tend to pool and hoof action can damage plants.

When should I irrigate with a limited water situation?

Maximum water use is during vegetative growth.

Is any late-fall or winter irrigation needed?

Filling the soil profile is always helpful.

Fertilization

If I can't chemigate, what is the next best alternative?

Starter application in spring, with a layby or broadcast treatment during vegetative growth and in early fall.

When do I fertilize irrigated grass and how much? (nitrogen)

*200 lbs a year with split applications at planting and vegetative growth and fall regrowth.
Use soil test recommendations.*

What about phosphorus?

Use soil test recommendations.

Shouldn't nutrient recycling reduce fertilizer needs?

Yes, but it does not provide all needs and is not uniform over the field.

How important is soil sampling in a rotational pasture system?

It dictates fertilizer needs.

Livestock and Grazing Management

What about soil compaction? Is aeration needed?

Generally not on sandy soils except near a water source.

Will manure buildup be a problem?

No, it may need to be spread to break up clods.

What stocking rates will I be able to run?

Established — 6-8 AUM/acre, assuming average water supply; stocking must be reduced during heat of summer.

Can nitrate buildup in the forage be a problem?

Yes, with annual forages use soil test for fertilization and test feeds for nitrates.

It's not usually a problem in established, irrigated perennial grass.

Are there any diseases or deficiencies to look for? What mineral package/supplement should I be using?

Use a high magnesium mineral supplement when turning cattle out on lush green growth.

Use phosphorus, copper and zinc as forage matures.

What is the best indicator of time to move animals to another paddock?

28 days deferment between withdrawal and re-entry.

6-8 inches of growth before turnout.

Always leave 6 inches or more of growth.

Can internal parasites be a problem?

They may be a problem on short wet pastures.

Will an abundance of alfalfa in pastures affect cow pregnancy rate?

There is some evidence that fertility can be adversely affected.

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Forages

Issued September 2003

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