MANAGEMENT NOTES

Controlling Blowouts for Forage Production

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Highlight

Blowouts on sandy soils in the Great Plains can be controlled by leveling hummocks and shaping sharp banks, developing sorghum stubble and seeding warm-season grasses into the stubble. This practice will provide grazeable forage and reduce damage to adjacent areas by wind-blown soil.

Removal of the protective cover of native vegetation by heavy grazing or cultivation has resulted in blowouts on sandy soils throughout the Great Plains. These blowouts vary in size from small pockets to several acres and represent two areas of disturbance—the area from which soil is removed and the areas upon which wind blown soil is deposited. The result is two sources of economic loss—reduced forage and livestock production on the blowout and damage from deposition on adjacent lands and installations.

Research on blowout reclamation was initiated at the Eastern Colorado Range Station in 1954. Annual precipitation at the station is 14.8 inches with about 75% occurring from May through July. In 1954 and 1955 treatments were applied to an 18 acre blowout in strips 750 feet long and varying in width from 20 to 80 feet. The blowout was first bulldozed to remove sharp banks so that seeding equipment could be used and to reduce further wind

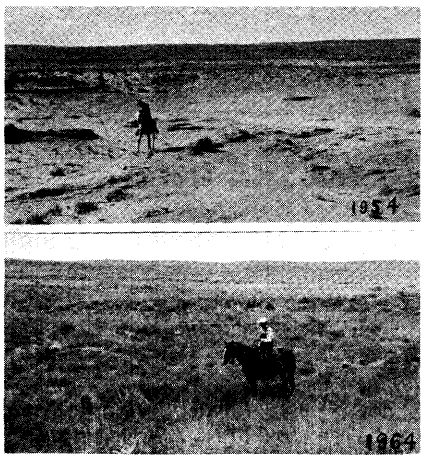

FIGURE 1. *Top*, Original blowout in 1954 before treatment; *bottom*, blowout in 1964 after treatment and vegetation establishment.

scouring. Then the following treatments were applied:

1. Seeding, application of 7 to 8 tons/acre of manure and cultipacking.

2. Fertilizing with 100 lb of 33% ammonium nitrate, or 210 lb of 43% phosphorous pentoxide, or a combination of nitrogen and phosphorus at equivalent rates per acre; seeding; application of 1 to 1.5 tons/acre of grain straw and cultipacking.

3. Planting sorghum in 12-inch rows. Fertilizing with nitrogen phosphorus, or nitrogen and phosphorus and seeding into the sorghum stubble the next year.

In 1954 a mixture of cool-season grasses including 5 lb of tall wheatgrass *(Agropyron elongatum* (Host.) Beauv.), 5 lb intermediate wheatgrass *(A. intermedium* (Host.) Beauv.) and 3 lb yellow sweet clover *(Melilotus officinalis* (L.) Lam.) was planted in the manure and straw treatment strips. A warm-season grass mixture including 2 lb each of sideoats grama *(Bouteloua curtipendula* (Michx.) Torr.), switchgrass *(Panicum virgatum* L.), indiangrass *(Sorghastrum nutans* L.), bluestem mixture *(Andropogon)* and yellow sweetclover was also planted in these strips.

Nitrogen and/or phosphorus fertilizers, as outlined in basic treatment number 2, were applied to one fourth of each straw treatment strip prior to seeding and covering with straw. Sorghum, at the rate of 20 lb/acre in 12-inch rows, was planted in strips to establish a stubble in which to plant grass the following year.

The manure and the straw treatments were repeated in 1955. The sorghum stubble strips were fertilized with nitrogen and/or phosphorus as indicated for straw treatment strips and then were seeded with the appropriate grass mixture. The cool-season mixture in 1955 was made up of 3 lb each of tall wheatgrass, intermediate wheatgrass, desert wheatgrass, also called crested wheatgrass *(Agropyron desertorum* (Fisch.) Schult). The warm-season mixture was the same as that used in 1954, except the bluestem mixture was omitted.

The stand of grass developed slowly under the extreme habitat conditions and grazing was deferred until 1961. It has been grazed for about 2 months each summer since then. The stocking rate was 2.5 acres/cow month in 1961 and 1.5 acres in 1964. This indicates the stand of grass has continued to become more productive. The stocking rate compares favorably with 1.6 acres/cow month under moderate grazing on native range.

In August 1964 two hundred systematically-located point-plots were recorded by species in each of the 28 strips. There were no differences in improving stand establishment among seedbed preparation methods nor did commercial fertilizers or manure improve establishment. During the 10-year period, 1954 to 1964, the cool and warm-season grasses had interseeded across treatment strips and the original strips almost lost their identity. The kinds of plants and cover indicated in Table 1

Table 1. Plants that were most numerous in the reseeded blowout on the basis of 5600 plots.

Species	Number of plants	Percent of all plots
Switchgrass	853	15.2
Sand dropseed (*Sporobolus cryptandrus* (Torr.) A. Gray)	566	10.1
Sideoats grama	492	8.8
Sand lovegrass	461	8.2
Slimflower scurfpea (*Psoralea tenuiflora* Pursh)	410	7.3
Crested wheatgrass	378	6.8
Yellow sweetclover	247	4.4
Other species	606	10.8
Blank spaces	1587	28.4
	5600	100.0

are adequate to control wind erosion and to permit controlled grazing.

The approximate cost of the three seedbed cover treatments for the seed and the cover material was $29 to $35 for the manure treatment, $25 to $35 for the straw treatment, and $6.75 to $12.25 for the sorghum treatment. Bulldozing, planting and fertilizing were additional costs. Nitrogen cost $4.60/acre; phosphorus, $8.60, and nitrogen plus phosphorus, $13.20.

These costs were based on experimental procedures in order to compare a number of species, fertilizer combinations, and ground covers. The cost of planting the sorghum and grass seed would have been considerably less if the fertilizer had not been added.

Summary

The most economical and satisfactory method to stabilize and reclaim sandy blowout areas in eastern Colorado is to level hummocks and shape sharp banks, plant sorghum to establish a ground cover, and plant forage species into the sorghum stubble the following year.

The recommended rates and species to plant are 2 pounds of switchgrass, 2 pounds of sideoats grama, and 1 pound of sand lovegrass per acre. Commercial fertilizers have not been effective in improving stand establishment.

Prior to planting a blowout, uneven places and sharp banks must be shaped and smoothed. This is necessary in order to permit the use of seeding equipment, mulch spreaders and cultipackers. It also minimizes further wind action which could cover the seeds too deeply or possibly blow them away.

The best time to level and smooth out the blowout is in early spring just prior to planting. The blowout should be fenced to protect the plants from grazing during the years required for establishment.

When grazing is permitted, stocking rates must be closely controlled to prevent overgrazing and the formation of another blowout.