Labor Savings from Controlling Brush in the Texas Rolling Plains

Don Ethridge, Jon Weddle, Kenneth Bowman, and Henry Wright

Three problem plant species in the Texas Rolling Plains are honey mesquite, redberry juniper, commonly called cedar, and pricklypear. Mesquite trees reduce the forage available to livestock through their use of soil moisture and the shading effects of their canopy. Dense stands of mesquite also make working and monitoring cattle difficult. Cedar trees compete with grasses for moisture and sunlight and usually occur in the rougher topography. Pricklypear is very thick on 20 to 30 million acres that center in the Shackelford county area (Fig. 1).

Many ranchers in West Texas believe that they must "fight the brush or give up." A variety of control methods are used. Aerial spraying is the most widely used method, especially on high density mesquite. However, chaining also has widespread use, particularly for cedar. Prescribed burning is increasingly used as a follow-up treatment to other methods, largely because of its low cash cost outlay. Other methods such as individual tree grubbing and root plowing are used alone or in combination with other methods. For example, some ranchers chain cedar areas, then burn the following year to remove the rubble. Ranchers frequently use different control measures on different range sites. The life of a treatment varies with the type of treatment, species, soil type, and depth, terrain, range condition, and rainfall. Chemical spraying typically lasts from 5 to 12 years on mesquite (Ethridge, Dahl, and Sosebee 1984; VanTassell and Conner 1986). Combined chaining and burning on cedar may last 10 to 15 years (Steuter and Wright 1983). Burning is a low direct cost method of control, but it has some indirect costs—primarily deferral of grazing to allow accumulation of fuel to support fire—which some ranchers prefer to avoid.

Need for Information

Different ranch situations and rancher assessments and philosophies dictate the use of vastly divergent approaches. One aspect of brush control practices which has received little attention and analysis is the benefits of brush control which result from increased operating efficiency (decreases in operating costs). These reductions result from labor savings due to working and monitoring cattle more effectively and with less time.

Resource situations and approaches to ranch management vary within West and Central Texas, causing problems in quantifying the magnitude of the operational benefits. It was decided that the only feasible way to determine the benefits was through a survey of ranchers in the region. Personal interviews were conducted with 6 ranchers, all with extensive management experience. The 6 individuals collectively manage about 660,000 acres of rangeland in five counties—Cottle, Dickens, Foard, King, and Motley (Fig. 1). All of the managers interviewed were considered as progressive, high-level management. The interviews covered aspects of general ranch operation, management approaches and objectives, views about brush control and approaches to specific types of brush problems, and specific observations on the benefits and costs of brush control on their individual ranches. In some cases the ranch managers could estimate some of the benefits directly; in other cases the effects of controlling brush were derived by deducing the effects from their answers to a series of questions.

The intent of the survey and the subsequent analysis of the data was to provide an estimate of the general magnitude of the benefits from savings in labor costs, not to...
Untreated juniper with treated land in foreground.

Three years after dozing burning juniper.
derive "magic numbers" which presumably fit every ranch. The latter is an impossible task.

Findings

A summary of results from the survey is shown in Table 1. The column on livestock stocking capacity does not relate directly to labor costs, but is presented to provide an additional perspective on overall cost per animal.

Table 1. Effects of brush control on indicators of operating efficiency, Texas Rolling Plains.

<table>
<thead>
<tr>
<th>Rancher</th>
<th>Percentage increase in livestock stocking capacity</th>
<th>Percentage decrease in permanent ranch working crew</th>
<th>Percentage decrease in round-up labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>67</td>
<td>?</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>100</td>
<td>67</td>
<td>?</td>
</tr>
<tr>
<td>4</td>
<td>25</td>
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<tr>
<td>5</td>
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<td>6</td>
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<td>71</td>
<td>89</td>
</tr>
<tr>
<td>Simple average</td>
<td>51</td>
<td>53</td>
<td>51</td>
</tr>
<tr>
<td>Weighted average</td>
<td>42</td>
<td>59</td>
<td>58</td>
</tr>
</tbody>
</table>

¹The crew which tends to animals on a daily/weekly basis.

Interpretation of the data is illustrated with the following examples. Rancher No. 2 estimated that he could stock his ranch with 67% more cattle with brush control than without brush control. Rancher No. 1 estimated that brush control enables him to work the ranch on an ongoing basis with 50% fewer employees than he would need without brush control. Rancher No. 6 estimated a decrease of 89% in temporary labor at roundup time. (The ?'s indicate that the rancher was not willing to provide an estimate). The variation in estimates among the ranchers illustrates the wide range of situations and approaches within the region.

The simple average gives the same weight to the opinion of each rancher, regardless of the size of the ranch. The weighted average uses the ranch size in proportion to the total rangeland represented in the survey as weights in the average. These averages suggest that stocking capacity is increased 40–50% by brush control on the average. Consequently, the fixed costs associated with land, buildings, equipment, and management are spread over about 50% more cattle, making the fixed cost per animal unit about two-thirds of the cost without brush control.

Savings in labor used in working the cattle are substantial. The number of regular ranch employees required to care for the cattle decreases 50–60% with brush control. For example, if an employee can care for 300 cows without brush control and 667 cows with brush control (a 55% decrease in employees) and is paid $20,000 annually (cash and in-kind pay), then cost per cow per year declines from $67 to $30. Assuming a stocking rate of 30 acres per animal, the $37 cost saving per head per year translates to $1.23 per acre per year. Accounting for associated employee costs such as unemployment insurance, social security contributions, health insurance, and equipment per employee, the cost savings is substantially larger.

Labor for roundup and working of cattle also decreases by 50–60% with brush control. If a roundup requires 30 man-days to work 500 head of cattle without brush control and 12 man-days with brush control (a decrease of 60%) and temporary day labor costs $50 per day, then roundup costs decrease from $1,500 per year ($3 per head per day) to $600 per year ($1.20 per head per year). With a stocking rate of 30 acres per animal, the $1.80 per head cost saving is equivalent to $.06 per acre per year. Adding the permanent labor savings to the roundup labor savings under the assumed conditions, the saving is $38.80 per head or $1.29 per acre per year on labor alone.

There are several other factors brought out in the discussions with the ranchers. One is that the brush and wild

Burning taking place after chaining.
cattle go hand-in-hand; brush control makes the cattle more docile and easier to handle. Also, none of the ranchers noted any perceptible change in death losses of cows or calves associated with brush control. Some indicated that brush control facilitates location and treatment of sick and crippled animals. Additionally, several indicated that ranch production is also enhanced by brush control through an increase in calf weights. One rancher suggested that weaning weights may be 100 pounds greater with brush control in addition to being able to carry 30–40% more livestock.

Grazing Systems in Wyoming—Impacts of Grazing Pressure and Livestock Distribution

Richard H. Hart, Marilyn J. Samuel, James W. Waggoner Jr., and Michael A. Smith

"The conventional or government-prescribed stocking rates can safely be doubled in the first year of operation. There is never a need to reduce numbers." These are the rather startling claims made by Allan Savory (1983) for short-duration rotation or time-controlled grazing as applied in the Savory Grazing Method (SGM). Such claims are highly attractive to ranchers struggling to stay in business, but many range scientists have concluded that these claims are not supported by data.

Short-duration rotation grazing is a form of grazing management in which the time that grazing animals spend in each pasture and the time that each pasture is rested vary with the growth rate of the forage and the amount of forage in the pasture. When grass is growing fast, animals spend fewer days in each pasture, with correspondingly shorter rest intervals. Animals are moved to another pasture before they graze the new regrowth and before gains are seriously reduced by a shortage of forage.

Concentrating the herd in one small pasture at a time is claimed to produce "hoof action" (Savory 1983, 1988) which breaks up surface crusts, helps water soak into the ground, and incorporates dead plant material (litter) and manure into the soil to release plant nutrients. However, trampling slows the rate of water infiltration and increases erosion (Blackburn 1984); this happens regardless of grazing system. Savory (1983, 1988) claims that hoof action buries seeds and helps new plants become established, but seed and seedlings play little part in maintaining stands of important perennial range plants in short- and mixed-grass prairie (Hyder et al. 1975).

In short-duration rotation grazing, any arrangement of pastures can be used which allows easy movement of livestock. With suitable pasture arrangement and training of animals, most of them will move themselves when the proper gates are opened. If animal movement can be controlled by herding, controlling water, or some other method, extensive fencing may not be necessary.

Grazing Systems and Stocking Rates

Beginning in 1982, we compared the effects of an 8-paddock short-duration rotation system, a 4-pasture rotationally deferred system, and continuous grazing on animals, plants, and soils, at a range of grazing pressures. The study was done on blue grama-western wheatgrass range in high good condition at the High Plains Grasslands Research Station near Cheyenne, Wyoming.

Each system was stocked at a moderate and a heavy rate. Each system–stocking rate combination was duplicated. In 1983, a very light stocking rate under continuous grazing was added but not duplicated. Light, moderate, and heavy stocking rates were applied on pastures of 202, 30 and 22.5 acres, respectively. Grazing seasons, precipitation, forage production, and stocking rates are shown in Table 1 and are described in more detail by Hart et al. (1988). We determined forage production on four exclosures in each pasture. In 1982 and 1983 we clipped in late July or early August, when standing crop was near maximum. In 1984–1987 we clipped some quadrats and estimated production on the rest with a capacitance meter. We moved exclosures each year, but they remained on the same soil type. Bare ground, litter cover, or plant cover was deter-