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Rangelands

FEATURE ARTICLES

DEPARTMENTS

COVER

Front Cover: Mule deer buck and wild turkeys are alert to interlopers on their sunny pasture near Ekalaka, Montana. **Back Cover:** Summer colors in a fall pasture near Ekalaka, Montana. Pictured are *Lupinus argenteus* and *Echinacea angustifolia*. Photos by Chad Prosser, Sidney, Montana.

c. the overstocking around settlements and wells caused rapid, huge and sometime irreversible damages to vegetation and soil of the arid fragile rangelands,
d. the rhythmic movement from one area to another according to the availability of forages was reduced due to spread of livestock moving vehicles, limiting progressive grazing.
e. government feed subsides
f. restriction of movements through borders of neighbour countries
g. other various sociological, economical, political and legal problems.

The present seasonal livestock feed source in Jordan is to graze on marginal lands for 3 months, to graze on cereal stubble in rain-fed areas for 4 months, to graze on natural pasture in rain-fed areas for 1.5 months and to feed supplements for 3.5 months. The big challenge facing the country is how to raise productivity of the arid rangelands.

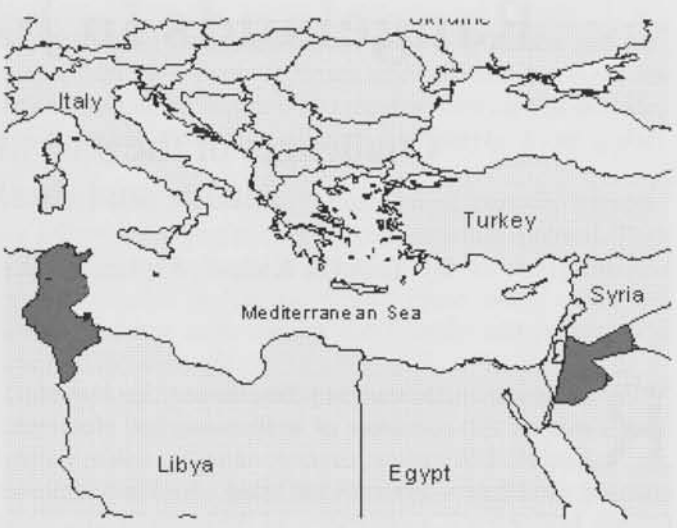
A well-organised program for the development of rangelands would have considerable economic and social benefits. Further delay in providing support to restoring these areas poses serious hazards, such as progressive erosion, threat of desertification and lowering income, which leads to migration to urban centres.

Research projects have been started to find adapted and productive species for reseeding, and to increase water harvesting in these arid rangelands. Lack of progress in range improvement appears to be a result of poor long-term integrated planning, failure to recognise the seriousness of rangeland problems and lack of innovation to address them. Planners recognise the urgent need to gain self sufficiency in agricultural products using the potential of natural wildlands. For full recovery of these severely depleted lands, a range development and improvement program must be implemented to establish and maintain valuable forage resources.

Tunisian Rangelands

Like in Jordan, population growth in Tunisia during the past forty years has triggered a dramatic increase of livestock numbers in the country. Sheep and goat population has increased by more than two-fold between 1964 and 2000. Simultaneously, the large nomadic herds that grazed the area in the past have been replaced by small poorly managed flocks, as the livestock systems changed from nomadic to sedentary farming. This new lifestyle has been accompanied by converting the most fertile grazing lands to cereal, olive, or almond production and establishing year-long grazing of the remaining rangelands.

Little attention has been given to the development of forage crops and agricultural by-products or to the improvement and the management of natural rangelands. Insufficient rainfall and overgrazing has contributed to a serious soil and vegetative cover deterioration of existing rangelands and feed deficits are continuing.



Locality map of Tunisia (left) and Jordan (right).

Tunisian territory covers more than 16 M hectares. Forest and natural rangelands occupy around 33% of the total area. The most obvious constraint on livestock production in the country is the shortages of animal feed. Rangeland areas have become degraded as a result of overstocking resulting in a severe reduction of carrying capacity. Rangelands have been converted to cereal and fruit trees plantations, whose contribution to annual feed requirements is more and more limited. Supplementation from other sources of forage, by-products and concentrates is becoming increasingly needed. The changes of marginal land and other land areas have contributed to huge annual reductions of animal feed. For example, between 1979 and 1988, areas covered by cultivated lands increased by 17.7%.

Areas with less than 250 mm precipitation, lands that once were productive grazing lands, are now converted to marginal farmland producing cereal crops only 2 years out of 5. During years of adequate fall rains farmers plant cereal which may be grazed if spring rainfall is low. During years of inadequate fall rains farmers keep their lands for grazing. The improvement toward the restoration of the soil vegetative cover has become difficult or impossible.

The high rate of crop failures due to inadequate and inconsistent rainfall has resulted in much of the marginal cropping reverting back to grazing, leading to low value forage plants as the prominent source of livestock feed. Palatable range species have partially or fully disappeared and the soil degradation reached 75% in some areas. Up until 1960, livestock numbers were highly affected by the climatic conditions which periodically reduced the available forage. The cyclic periods of drought led to huge animal losses. Since 1960, even though rangelands continue to decrease, the impact of drought periods on livestock feed resources decreased due to the progressive modifications in

When such plants were found, we tried to determine why they had escaped browsing. If a plant was deemed to have escaped browsing because of local protection, we discounted the architecture of that plant as an indicator of area-wide browsing pressure. Local protection of a young plant might occur when a taller neighbor inhibits ungulate access, either directly or by creating a deep snowdrift. When these circumstances were confined to a few square meters, we assumed that the protective effect was temporary.

Plant height. Plant height was documented by narrative description in the Sullivan Creek survey and by mapping in the Deep Creek survey. In the Sullivan Creek survey, we described the general circumstances under which willows greater than 10-feet (3-m) tall were found.

In the Deep Creek survey, we distinguished between three plant-height categories: a) Short (the plant is < 20-inches (50-cm) tall, symbolized by "S"), b) Intermediate (between 20-inches (50-cm) and 9.8-feet (3-m) tall, symbolized by "I"), and Tall (> 9.8-feet (3-m tall), symbolized by "T"). Plant-community height characteristics were described using combinations of the three categories: S, I, T, SI, ST, IT, and SIT. For example, a community composed of willows less than 20-inches (50-cm) tall and willows greater than 9.8-feet (3-m) tall would be designated ST. A site that has experienced protracted intense browsing may be composed entirely of plants in the S category. During the winter, plants in the S category often are buried by snow and unavailable to ungulates. Plants in the I and T categories are a source of browse under diverse snow cover conditions.

Category T was distinguished because stems greater than 3-m tall often escape browsing. The presence of tall terminal leaders might allow a shrub to persist longer than shrubs that solely consist of shorter terminal leaders that are all heavily browsed. As in the mapping of browsing level, the total willow area was delineated on an aerial photograph and partitioned—as we traveled across the area—into the 7 mapping units listed above.

Deep Creek field survey. The surveyed segment was about 0.6 miles (1 km) long; willow covered 270 acres (110 ha) (Fig. 7). The entire area was classified as 100% intensely browsed. As above, the few uninterrupted-growth type plants were growing in vicinity of taller, heavily browsed, neighbors. We assumed the mechanical protection was temporary.

Stands that included willows greater than 9.8-feet (3-m) tall constituted 33% of the total willow area of 89 acres (36 ha) (Fig. 8). The remainder of the area (i.e., 67%) consisted of willows that ranged in height from ca. 8 inches to 8 feet (20–250 cm) tall. While we currently have no basis for quantitatively predicting the rate of decline, we do know that 67% of the willow area is susceptible to a relatively rapid rate of decline.

Sullivan Creek field survey. The surveyed segment of Sullivan Creek was about 2.2 miles (3.5 km) long; willow covered 570 acres (230 ha) (Fig. 9). The entire area was classified as 100% intensely browsed. Uninterrupted-growth-type plants were uncommon. In each case, we could identify how the plant was mechanically protected from browsing. If current browsing pressure continues, the protection will be temporary. As the plants adjacent to the uninterrupted-growth-type plants die, moose will focus on the remaining live plants.

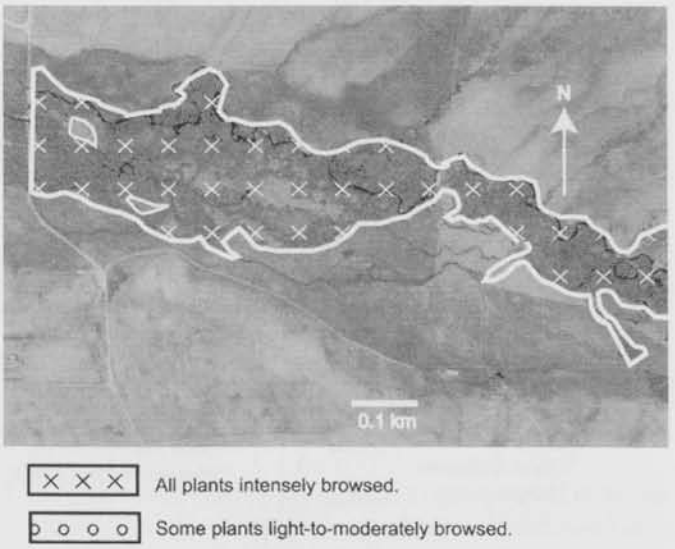


Fig. 7. ***Browsing intensity on Deep Creek segment of field survey. The entire area was 100% intensely browsed.***

Willows greater than 9.8 feet (3 m) tall grow in linear zones along current and relict watercourses. Linear zones of tall willows are also associated with beaver dams. Many of the ponds have drained, allowing willows to become established there; these willows range in height from about 8 inches to 7 feet (20–200 cm) tall. Willows could have become established on the beaver dams when the ponds were still filled with water, so in part, willows growing on the dams may be taller because they are older than willows growing on the former pond areas. In part, the difference in

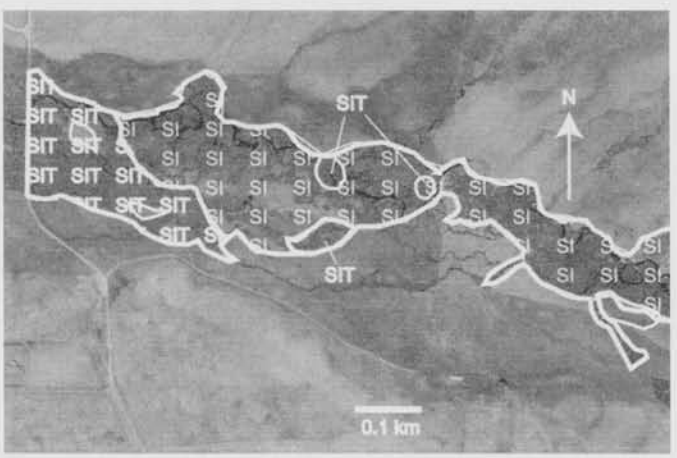


Fig. 8. ***Willow height at Deep Creek segment.***

Effects Of Early Weaning And Length Of Supplementation On Beef Calves

A. J. Pordomingo

Two studies were conducted to evaluate performance of calves weaned at different ages and allowed to graze alfalfa pasture. Calves weaned at 70 to 80 days of age were the most affected by feeding programs with a supplementation period on pasture shorter than 45 days. Shortening of supplementation period on pasture to 15 days after weaning can have negative effects on performance but, the effect was less dramatic when calves were 90-days old or older at weaning time. If calves are younger, supplementation during at least 45 days may be necessary to achieve an acceptable growth rate.

Calibrating Fecal NIRS Equations For Predicting Botanical Composition Of Diets

John W. Walker, Scott D. McCoy, Karen L. Launchbaugh, Merrita J. Fraker, and Jeff Powell

Because material being predicted is not available for standard laboratory analysis, use of near infrared spectroscopy (NIRS) to predict dietary parameters of grazing animals presents unique challenges and limitations. Results of three feeding trials that were considered different populations showed predictions of percent sagebrush in the diet within the same population were precise and accurate. When calibrations were from a different population than the samples predicted, resultant predictions were not accurate but they were precise (high $R.^2$). NIRS predictions using fecal material represents an interval level of measurement, which contains sufficient information for addressing many questions on rangelands.

Rangelands Gears Up For 25th Anniversary

In 2003, *Rangelands* will celebrate its 25th anniversary. And, we'd like your heldp in commemorating this special occasion. Throughout the 2003 we plan to feature special articles and memories from the past 25 years in the six issues of *Rangelands*. If you would like to submit an article or have a photo or comment to share relating to *Rangelands*, please submit it to Kindra Gordon, PO Box 645, Spearfish, SD 57783 or e-mail kindras@gordonresources.com.

Note, the *Rangelands* editorial staff will carefully consider all items that are submitted, but will not guarantee that all submitted items will be published.

Clipping And Precipitation Influences On Locoweed Vigor, Mortality and Toxicity

Michael H. Ralphs, Dale R. Gardner, J.David Graham, Gary Greathouse, and Anthony P. Knight

White locoweed causes chronic poisoning in livestock. White locoweed plants were clipped annually in New Mexico, Colorado and Utah to determine the impact of this stress on subsequent vigor and mortality. Clipping did not substantially reduce vigor, increase mortality, or affect toxicity, however, most locoweed plants died during drought periods in the respective regions. Increasing grazing pressure to force consumption of locoweed will not likely reduce white locoweed populations.