



# NORTH DAKOTA Farm Research

Bimonthly  
Bulletin

Vol. 36 No. 1

July-August, 1978





# GUEST COLUMN

By H. Goetz  
Chairman  
Department of  
Botany



The basis for all animal agriculture is grass, along with the other numerous plants that constitute a type of land referred to as rangeland. On this unique type of land, generally too rough, stony, salty, or otherwise unsuited to cereal crop production, is to be found nature's perennial crop of native grasses, forbs, and shrubs. This should, perhaps, be viewed as one of the most valuable renewable natural resources in the state of North Dakota.

Year after year we take for granted that the good earth will bring forth, with the advent of spring, a new crop of native plants to beautify our landscape and to provide forage, cover, and homes for the many domestic and wild animals dependent upon them. We take for granted that somehow the "right" kinds of grasses and other plants will keep coming back each year to provide the optimum kinds and amounts of forage necessary to maximize the continually increasing demands for red meat and wool products from our livestock industry. Somehow we expect that the miraculous appearance of these plants can be relied upon without any cultural treatments despite being abused, overused, and mismanaged without apparent limits or ill effects. Unfortunately, a recognition of the heresy of this philosophy has been slow in coming, and even today a substantial percentage of the native rangelands of North Dakota and throughout the world are subjected to abuse and mismanagement.

In North Dakota we have approximately 13 million acres classified as native rangeland. This equals approximately one-third of the total land area of the state and accounts for nearly one-fourth of the agricultural income realized primarily from animal products.

Research on native range has been carried out since the turn of the century by the USDA, ARS at Mandan and by the Agricultural Experiment Station. Early researchers trained in the botanical sciences and plant ecology recognized the uniqueness of the prairie and the need to view it as a resource which required a high level of management if the full potential benefits were to be realized by livestock producers and wildlife managers.

The prairie or rangeland ecosystem (total of all interacting parts) is unique, complex, but also, to a degree, predictable. Made up of many individual kinds of species, each one having different growing requirements in terms of time, space, nutrients, and physiology, the native grassland or range becomes a complex entity to

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**On the cover:** Members of a rangeland plant community depicted in the cover drawing are: (l to r) western wheatgrass (*Agropyron smithii*), purple coneflower (*Echinacea pallida*), blue grama (*Bouteloua gracilis*), threadleaved sedge (*Carex filifolia*), fringed or pasture sagebrush (*Artemisia frigida*) and Junegrass (*Koeleria cristata*). —Drawing by Dorothea McCullough

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Vol. 36, No. 1

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A BIMONTHLY progress report published  
by the

**Agricultural Experiment Station,  
North Dakota State University of  
Agriculture and Applied Science  
Fargo, North Dakota 58102**

**Arlon G. Hazen**

*Dean of Agriculture, and Director  
of Agricultural Experiment Station*

**EDITORIAL ADVISOR**

*H. Roald Lund*

**EDITORS**

*Gary Moran*

*Dorothea McCullough*



by periodic sampling with neutron probes. Penetrometer readings are being used to determine if trampling resulting from grazing intensity affects compaction. Bulk density and root biomass data also are being collected during the study.

The spoil materials at this grazing site have few, if any, properties that restrict plant growth. They were low in sodium and soluble salts and even without the addition of topsoil, good grass stands were obtained. This site may not be representative of many of those expected to be released from bond in the future because this site was reclaimed before topsoil replacement was required by North Dakota law. However, results from this study should provide some indication of what problems may arise as a result of grazing reclaimed mine lands.

To date, we do not have the data to permit us to compile or develop grazing recommendations for reclaimed land. We do not know if special precautions are mandatory or if problems will arise as reclaimed land is again grazed. It will take several years of study before we know the effects of drought or overgrazing. The same basic data will be required that have been gathered for years on unmined land to determine if the effects of graz-

ing mined or unmined land are comparable. Continued monitoring and evaluation of data from this study should supply information necessary to answer questions on the effects of grazing the "new" lands in North Dakota and in other areas in the Northern Great Plains.



**Steer grazing pasture on reclaimed strip-mined land.**

### **Continued from Page 2.**

manage in a way which will allow the greatest and most sustained production from the most dominant and desirable species. Failure to recognize and manage the range according to known principles results in the slow but certain elimination or lowered production of the desirable plants and an increase in the less desirable. Associated with this change in the composition of the prairie may be loss in soil structure, water intake, loss of nutrients, and increased soil erosion. The end result is a greatly reduced amount of animal product which can be realized from each acre of native rangeland.

Agricultural experiment stations throughout the United States, Canada, and Mexico have only recently begun to recognize the immense importance rangelands will play in the future of animal agriculture. National and regional task force reports indicate a need to increase red meat production from the nation's rangelands by a minimum of 100 per cent over the next two decades. Plans for a more concerted effort by the western states, including North Dakota, have been developed and elaborated by appropriate committees appointed by the different state experiment stations under the auspices of the Great Plains Agricultural Council and federal agencies. One of the major difficulties in instituting rangeland research as such is that rangeland is still being viewed as a commodity instead of the natural renewable resource that it actually is. The obscuring of rangeland and research by fragmentation of effort and division among numerous research problem areas (RPA) within broad resource and commodity designations has greatly reduced or inhibited productive efforts related primarily to the solving of problems unique to rangelands.

New emphasis on integrated beef and grassland research has been instituted and is presently being carried out by several departments from North Dakota State University as multidisciplinary research under the state and federal cooperative efforts supported by a recently

created organization known as the Beef and Grass Committee for the state of North Dakota. Cooperative research between the U.S. Forest Service, the Sheyenne Grazing Association, Agricultural Research Service, and the Agricultural Experiment Station is a model of the positive approach to carrying out research which will both satisfy and benefit the many demands and kinds of uses by the different agencies and livestock producers.

The proposed Central Grassland Research Station on the Coteau area of North Dakota is yet another positive indication of the recognition of the necessity to manage the native grassland for its full potential along with the integration of seeded forage grasses and legumes as complementary pastures for a maximized livestock production system. Management techniques utilizing deferred and rotation grazing schemes, fertilization of seeded and selected native ranges, burning, combining different classes of livestock, and more effective livestock distribution systems are proven methods which can be applied by the more intensive and profit minded manager. At the same time, research must move forward in the continuing development of more and better forage grass varieties, breeds of animals, and application of the techniques already mentioned in a more intensive and systematic level of management. It must be recognized that these rangelands can be utilized most effectively and efficiently by the grazing animal by the direct conversion of forage plants to the production of red meat.

The recognition of the critical role that native rangelands now play and the increased demand for red meat production, recreational use, watershed management, wildlife development, energy and coal mining, and natural gene pool preservation at the national and global levels can only serve to urge us to continue our present efforts with ever more diligence and intensity. Nature has provided us with a reliable but very complex system; our challenge is to maintain and perhaps even improve its productive capacity for the benefit of all mankind.



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Agricultural Experiment Station  
**NORTH DAKOTA STATE UNIVERSITY**  
of Agriculture and Applied Science  
University Station  
Fargo, North Dakota 58102  
Publication

*Alvin L. Hagen*

DIRECTOR

to

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U.S. DEPARTMENT OF  
AGRICULTURE  
AGR 101



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## Design Revised for Trussed Rafters

The booklet "Designs for Glued Trusses" was revised recently to meet new lumber design.

The revision was necessary because of a reduction in the allowable tensile stresses in some larger sizes of lumber. Generally this revision means that certain sized trussed rafters will now need larger, lower chords or cross-ties.

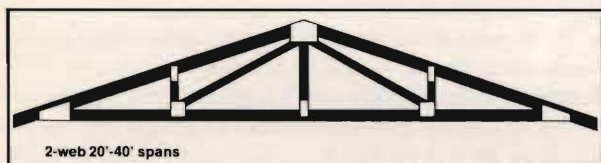
Some changes have also been made in the plywood gusset plates used for the truss rafters. In some sizes of rafters larger gussets are now needed to cover the extra lumber used at joints in the rafter.

Other design changes were made in the bracing. This was to stiffen up and reinforce the longer braces used in some rafters.

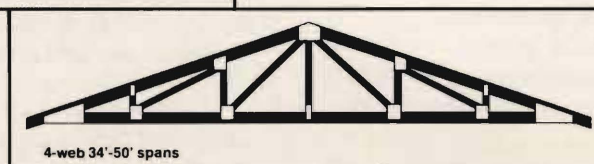
The most change from previous truss rafter designs was made in the wider spans and the wider rafter spacings such as 50 ft. and 60 ft. truss rafters.

For example, comparison of the old to the revised plan for a 40-ft. wide rafter to be spaced on 8-ft. centers shows that a double, 2 x 6 inch member is now needed for the lower chord rather than a 2 x 8 inch as before.

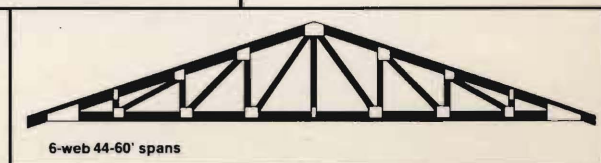
The "Designs for Glued Trusses" (MWPS-9) is available for \$2.50 through county extension offices or from the Extension Agricultural Engineer at NDSU. Several editions of this booklet have been made available since 1965. The new, 80 page booklet includes planning and construction information for glued truss rafters to span up to 60 ft.



2-web 20'-40' spans



4-web 34'-50' spans



6-web 44'-60' spans