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4-H Range Management and Conservation Club Manual : Extension Circular 1-31-2

Donald F. Burzlaff

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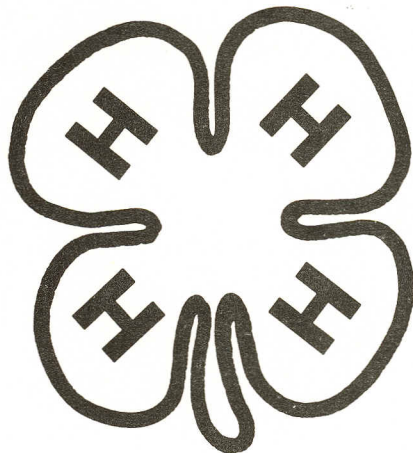
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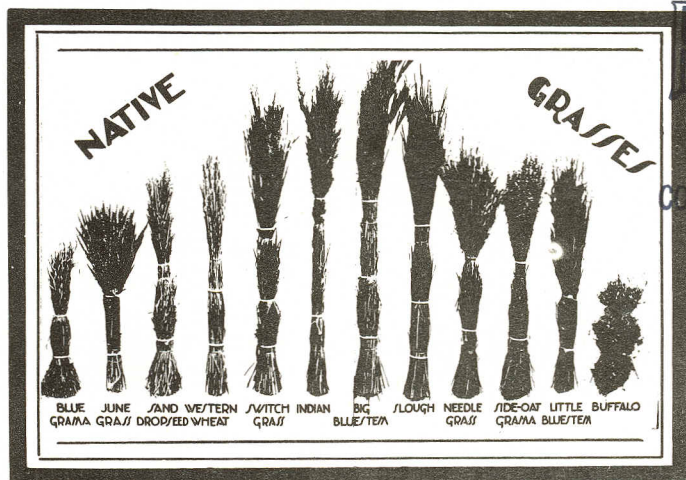
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4-H Range Management and Conservation Club Manual



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Achievement in range management is based on the identification and evaluation of important range plants.

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RANGE MANAGEMENT AND CONSERVATION 4-H CLUB MANUAL

Donald F. Burzlaff

Grass is Nebraska's most important natural resource. Over fifty percent of the land area of the state is devoted to the grazing industry. It is, then, only fitting that the 4-H boy and girl be encouraged to become more familiar with the principles of good range management by participating in a Range Management and Conservation Club. The ability of the individual to identify the plants growing on his range and to evaluate them in terms of importance to the grazing program is an important requisite for proper range care.

This manual has been prepared as an aid to leaders and club members alike. It will help you, as leaders, to help boys and girls in your club to carry on a progressive project in range conservation. As club members, careful study of this manual should open the door to a new field of learning.

The 4-H Project

The most satisfactory range management and conservation project will be carried on in conjunction with a livestock club. This is an excellent opportunity to impress upon the future ranchers of our state that the crop they are producing on their range lands is grass -- not cattle. Livestock is the harvesting mechanism and process through which the grass crop is converted into a marketable product. Help the club member to realize that on a well-managed ranch as much time and effort should be devoted to care and management of the grass as is spent in improving and caring for the livestock. Take care of the grass -- even the highest quality cattle cannot make good gains on overgrazed or poorly managed range land.

A well balanced 4-H program should be based on identification and evaluation of important range plants. But these are not the only things to consider. You should give attention to improvement of deteriorated range land, controlled grazing systems, eradication of undesirable plants, control of sand blow-outs, and fertilization of hay and meadow lands. Each of these phases of Range Management will be discussed in turn. Each 4-H member should be encouraged to follow a line of interest in selecting his range 4-H projects.

First Year Clubs

The first year of range club work should be limited to collecting, identifying, mounting, and displaying the most common range grasses.

The requirements for the first-year club member are as follows:

1. To be able to identify at least ten of the plants listed.
2. To build a plant press.
3. To collect and press the grasses he is able to identify.
4. To mount and maintain these specimens in a display book.
5. To attend the tour arranged by the county agent.
6. To keep a record of his activities in the club.
7. To seed a grass nursery if he so desires.

Suggestions for the organization of the first year's work program are listed below:

First meeting: Discuss the purpose of the range club, explain what will be expected of first-year members. Distribute manual and record books. A movie or series of slides may be helpful at this meeting.

Second meeting: Open the meeting with a discussion of the various characteristics of grasses. Explain what is meant by warm-season and cool-season grasses. Have mounted specimens of several grasses available and allow individuals to pick out the characters of a grass that helps them to associate a name with it.

Third meeting: Demonstrations on building plant presses and on how to collect and press grass specimens.

Fourth meeting: Work with identification of collected specimens, mounting pressed grasses in display books.

Fifth meeting: Arrange a field tour -- point out management practices and identify grasses. This is a good time to discuss the quality of some of the grasses.

Sixth meeting: Make preparations for displays and demonstrations at the county and state fairs.

Seventh meeting: Finish year's work -- complete record books and reorganize for another year.

Plants that the first-year member should collect, display, and be able to identify:
(any 10)

<u>Common Name</u>	<u>Scientific Name</u>
1. Big bluestem	Andropogon gerardi
2. Sand bluestem	Andropogon hallii
3. Little bluestem	Andropogon scoparius
4. Prairie three awn	Aristida oligantha

5. Side-oats grama	<i>Bouteloua curtipendula</i>
6. Blue grama	<i>Bouteloua gracilis</i>
7. Buffalo grass	<i>Büchloe dactyloides</i>
8. Prairie sandreed	<i>Calamovilfa longifolia</i>
9. Sand lovegrass	<i>Eragrostis trichodes</i>
10. Junegrass	<i>Koeleria cristata</i>
11. Woolly Indian wheat, Poor Joe	<i>Plantago purshii</i>
12. Indian grass	<i>Sorghastrum nutans</i>
13. Prairie cordgrass, sloughgrass	<i>Spartina pectinata</i>
14. Sand dropseed	<i>Sporobolus cryptandrus</i>
15. Porcupine grass	<i>Stipa spartea</i>

Suggested demonstrations for the initial year of club work in a Range program:

1. Building a plant press.
2. Proper or improved method of collecting and pressing a grass specimen.
3. Proper or improved method of mounting a pressed grass specimen.

Second Year Clubs

Identification and collection of grasses will be emphasized again in the second year of the range project. In addition to this work, an attempt should be made to evaluate the grasses for the second year member on the basis of forage value, palatability, and reaction to grazing. This is also a good year to bring improved management practices to their attention.

The second year 4-H member in a range management and conservation club will be required to:

1. Collect, press, mount, identify, and display six new or different plants than were used in first year.
2. To prepare a brief paragraph for five of the grasses collected the first year concerning their grazing value and importance on the rangeland. These should not be shorter than 50 words or more than 100 words for each grass.
3. To undertake some form of range improvement. This may be in the form of (1) control of sand blowout, (2) controlled grazing, (3) distribution of salt in relation to water, (4) reseeding an abandoned field, (5) fertilization of range or meadow land.
4. To seed a small grass nursery.
5. To keep an accurate record of his year's work and activity within the club.
6. To assist first year members with problems in collecting, mounting, and displaying their specimens.

Suggestions for organization of a second year club:

First meeting - Go over material for the coming year. Look over the display books and look for mistakes to be avoided in collecting, pressing, and mounting specimens in the second year.

Second meeting - Leaders should aid the second year member in the evaluation of the grasses collected in the previous year. Discuss and select range improvement project to be carried on during the year.

Third meeting - Demonstrations on range improvement projects can be given.

Fourth meeting - Work on collection and identification of range plants. Mount them in a new display book.

Fifth meeting - Field tour - identification and improved management practices.

Sixth meeting - Complete displays and demonstrations for county and state fairs.

Seventh meeting - Complete project records and reports.

Range plants for the second year member to collect, press, mount, and display (any 6)

<u>Common Name</u>	<u>Scientific Name</u>
1. Tall wheatgrass*	Agropyron elongatum
2. Western wheatgrass	Agropyron smithii
3. Cudweed sagebrush, white prairie sage	Artemesia gnaphalodes
4. Hairy grama	Bouteloua hirsuta
5. Smooth Brome*	Bromus inermis
6. Salt grass	Distichlis stricta
7. Canada wildrye	Elymus canadensis
8. Sandhill muhly	Muhlenbergia pungens
9. Switchgrass	Panicum virgatum
10. Purple prairie clover	Petalostemum purpureus
11. Blowout grass	Redfieldia flexuosa
12. Tall dropseed	Sporobolus asper
13. Needle and thread	Stipa comata

*Introduced grasses

Suggested demonstrations for a second year member:

1. How to control a sand blowout.
2. Placing of salt on the range to get best distribution of livestock.
3. Demonstrate an ideal deferred grazing system.

Third Year Clubs

As the member enters his third year of clubwork he is becoming quite familiar with range management and conservation ideals. Already he has learned sixteen or more of the major forage producing plants of the range land. He has worked with and observed proper management of the grass crop. In his third year he should expand his knowledge of plants and become better acquainted with their grazing value. Expose him to more of the principles that keep the range producing at its highest capacity.

The third year 4-H club member in a range management and conservation club is required to:

1. Collect, press, mount, and display ten new range plants.
2. Submit a brief paragraph on the grazing value and importance each of five additional grasses.
3. Continue with the range improvement project started in the second year or select a new project.
4. Become familiar with the methods used by the Soil Conservation Service in determining the condition of the range.
5. Complete the records on the grass nursery seeded the previous year.
6. Prepare a display or demonstration for the local county and state fairs.
7. Help first and second year members with problems encountered in their club work.

Suggestions for organization of the third year program:

First meeting - Present material for the coming year's work. Discuss problems that developed during second year work. Show movies or slides.

Second meeting - Discuss the qualities of some grasses and range plants. Work out plans for Range Improvement project.

Third meeting - Call upon local Soil Conservation Service representatives to present and explain the system used by their organization to determine the condition of the range.

Fourth meeting - Work on collection and pressing of plants required in third year. Help in identification will be necessary as little information is available on plants other than grasses.

Fifth meeting - Hold field tour on identification of range plants and management practices.

Sixth meeting - Prepare displays and demonstrations for county and state fairs.

Seventh meeting - Summarize three year's work. Complete records for the current year.

Range plants which the third year member should collect, mount, and display - (any 10):

<u>Common Name</u>	<u>Scientific Name</u>
1. Crested wheatgrass*	Agropyron cristatum
2. Intermediate wheatgrass*	Agropyron intermedium
3. Redtop*	Agrostis alba
4. Lead plant - Prairie shoestring	Amorpha canescens
5. Purple lovegrass	Eragrostis spectabilis
6. Sand paspalum or bead grass	Paspalum stramineum
7. White prairie clover	Petalostemum candidus
8. Silky prairie clover	Petalostemum villosus
9. Reed canary grass	Phalaris arundinacea
10. Timothy*	Phleum pratense
11. Kentucky bluegrass*	Poa pratensis
12. Silverleaf scurfpea	Psoralea argophylla
13. Lemon scurfpea	Psoralea lanceolata
14. Prairie dropseed	Sporobolus heterolepis

*Introduced grasses

Suggested demonstrations for a 3rd year member:

1. How to determine the condition of your range.
2. A good method of controlling a sand blow-out.
3. Demonstrate value of fertilizers in increasing production of meadow hay.

Identification of Grasses

It is not difficult to learn to identify grasses. Your ability to recognize the different grasses growing on your ranch will improve with experience. Did you know that all the grasses belong to the same plant family? Yet, each grass has a set of characteristics that make it different from every other kind of grass.

Your reaction as a club member to the field of plant identification will be similar to the situation that would present itself if you were enrolled in a new school. At first you may be somewhat confused by all the names of your new friends. Very soon you are associating names with individuals because of certain characteristics that each possesses. As you learn the names, you will soon be familiar with the qualities of the new acquaintances- be they desirable or undesirable.

The character most frequently used in the identification of grasses is the head or "inflorescence." There are three types of heads. The most common type is called a panicle and is found on oats, prairie sandreed, switchgrass, and many others. The next most common type of head is the spike, which is characteristic of wheat, barley, wheatgrasses, or Canada wildrye. The third type of inflorescence, the raceme, is least common. Crabgrass and sand paspalum are two grasses having a racemose head.

You will note from the following illustrations that the three types of inflorescences are quite different. The most important difference is in the attachment of the spikelet to the main axis of the head (rachis). The spikelets of the spike are attached directly to the rachis, while the spikelets of the raceme are attached to it by a short stem or pedicel. The rachis of a panicle is often elongated and much branched. The spikelets are attached to these branches (rays) by a pedicel.

As you work with the grasses you will find the key to their identity will often lie in the arrangement of the spikelet in the inflorescence.

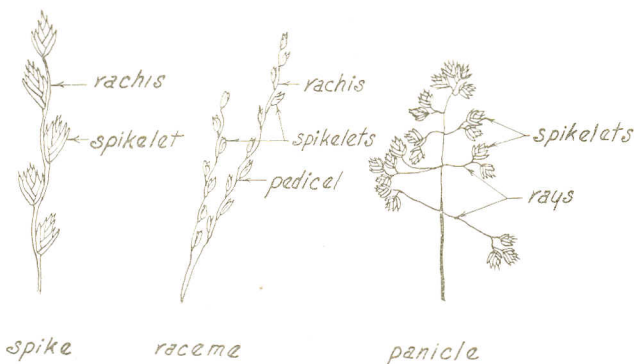


Figure 1. Grass inflorescence types.

The spikelet is the unit of the grass inflorescence. It consists of two glumes (modified leaves or bracts) and one or more florets. The number and arrangement of the florets in a spikelet are useful tools in the art of grass identification. The following figure is a diagrammatic illustration of the arrangement of these structures.

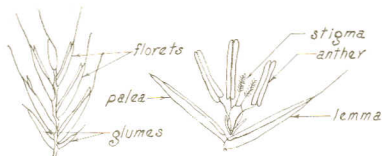


Figure 2. The grass spikelet and floret.

If it is necessary to identify a grass before the head has appeared, we rely on the stems and leaves to give us its name. This is called identification by vegetative characters.

The stem of a grass is called a culm. It is usually hollow with solid joints (nodes). Some grasses have creeping, above-ground stems similar to the runner of a strawberry. This type of stem is called a stolon. Stolons form roots at the nodes and develop into new plants. Buffalo grass is an example of a grass that reproduces by stolons.

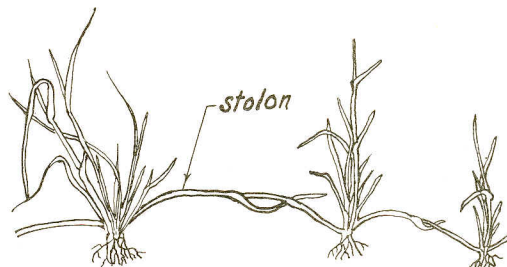


Figure 3. Buffalo grass with stolon.

Many grasses have a series of underground stems that give rise to new plants. These underground stems are called rhizomes. Two examples of grasses having rhizomes are western wheatgrass and prairie sand reed. Grasses that spread by means of rhizomes and stolons are called "sod-forming" grasses.



Figure 4. Grass with rhizomes.

Grasses which do not form sods but grow in individual clumps or bunches are called "bunch grasses." Bunch grasses do not have special organs for vegetative reproduction. They reproduce mainly by seed. Sand lovegrass, little bluestem and the needle grasses are typical bunch grasses.

The two main parts of a grass leaf are the sheath and the blade. Three minor structures or parts of a leaf are the: (1) auricle, (2) ligule, and (3) collar. These parts will always be very similar for any one kind of grass. Therefore, the leaves become a reliable means of identification. The auricles of a leaf are two ear-like appendages at the base of the leaf of certain grasses which clasp the stem at the collar. The auricles may or may not be present on a grass. The ligule is a membranaceous or hairy structure on the upper side of the leaf at the junction of the blade and the sheath. The collar of a leaf is the junction of the leaf blade and the sheath. The sheath is that part of the leaf which envelopes the stem. The blade is the flat, extended portion of the leaf which is characterized by parallel veins.

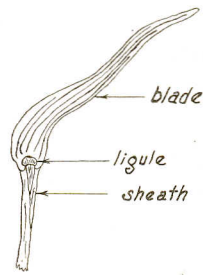


Figure 5. A grass leaf.

The preceding section on grass identification is intended as an aid to leaders of Range 4-H Clubs. It will not teach you to identify but was designed to assist you in the use of the more technical publications that are used in determining the identity of grasses.

Collecting, Pressing, and Mounting the Grass Specimen

Building a Plant Press. Before you attempt to collect any grasses for mounting in your display book, build yourself a plant press. A plant press is designed to be carried on the collecting trip and is the correct way to begin a good plant collection. Grasses that are properly collected, pressed, and dried will make neat, easy to mount specimens for your display.

A plant press as illustrated in Figure 6 is easy to construct. Pieces labeled A, B, C, and D in the illustration are $3/4'' \times 1\ 1/2'' \times 20''$ in dimension. It requires 8 such pieces to complete the plant press. The numbered pieces can be made of ordinary

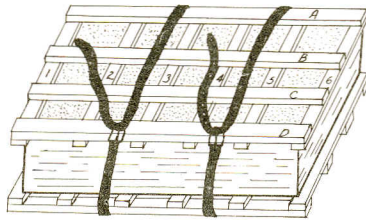


Figure 6. A simple plant press.

lath cut into 16" lengths. Twelve of these pieces are required to finish the press. When these pieces have been properly nailed together, slip a dozen old newspapers (folded in half) and some pieces of corrugated cardboard, that have been cut to size, between them. Two canvas, web, or leather belts are now needed to hold the frames and papers together.

Collecting and Pressing the Plant. After the plant press is assembled you are ready to collect plants. Tuck the press under your arm and take a hike into your native pastures or meadows. These areas will be the source of the grasses you must collect for your 4-H project. Take a garden spade or long bladed knife with you to dig out the plants.

Select only **mature** plants - those with flowers or heads formed - for collecting. Remove as much dirt as possible from the roots after digging out the plant. Loose dirt and sand will detract from the specimen after it is mounted. Place a piece of cardboard between the folded newspapers as each plant is collected. Place the collected plant between two or three thicknesses of newspaper. Arrange the stems,

leaves, roots, and inflorescence exactly as you want them to appear on the display sheet. Replace the top portion of the plant press, tighten the belts, and you are ready to look for another specimen. When you have completed the collecting for the day, tighten the straps of the plant press as much as possible. Be sure to change the newspapers between the plants every two days until the plants are completely dry. This will prevent the growth of mold on the plants.

Mounting the Plant on Display Sheets. When the plant is thoroughly dried it may be mounted on the pages of your display book. The sheets for mounting purposes should be at least 12" x 16" in size.

Arrange the plant on the sheet in an attractive manner. A cloth tape is more satisfactory than scotch tape for fastening plants to the paper. Leave room in the lower right-hand corner of the sheet for a small label like Figure 7.

Common Name:	Big Bluestem
Scientific Name:	Andropogon gerardi
Where collected:	Thomas County
Date:	August 15, 1953
Collected by:	John Doe

Figure 7. A satisfactory plant specimen label.

Range Improvement and Conservation Practices

Second and third year club members should initiate projects in some phase of range improvement and conservation. It is not only essential to know the plants which make up the forage crop but also to understand how to manage them to maintain a stand of the desirable grasses.

Range improvement includes such practices as range reseeding, sand blowout control, controlled grazing, fertilization, salt distribution, and construction of fences. The club member should be permitted to select a project from this list according to a particular line of interest and the time and resources he has available to devote to the work.

Range Reseeding. Before a rancher reseeds a deteriorated pasture or meadow he must first consider what adapted grass is available to suit his needs. For instance, if he wants an early spring pasture he will select a mixture of cool-season grasses, Should he desire a late summer pasture it would be to his advantage to select a warm-season grass mixture. When replacing a worn-out meadow he is likely to select some late maturing, high-yielding grasses and legumes.

To acquaint the club members with the many different kinds of grasses that may be planted, it is suggested that they plant a grass nursery. A well planned nursery project will teach the 4-H boy or girl a number of things:

1. To make observations.
2. Methods of planting and seedbed preparation.
3. Which grasses will become established and produce on their ranch or farm.

The nursery should consist of twelve grasses planted in eight-foot rows that are 12 to 18 inches apart. Seed the cool-season grasses early in the spring into a well-prepared, firm seedbed and then protect it for the year from chickens, dogs, and pigs. Perhaps a small fence would help with this. The warm-season grasses may be sown early in May.

The grasses you select for your nursery will depend upon those available at the various seed companies in your area. Here is a suggested list and planting arrangement for eleven grasses and one legume.

	Blue grama	Buffalo grass	Sand lovegrass	Switch grass	Big bluestem	Reed canary grass	Tall wheatgrass	Intermediate wheat, N.50	Timothy (Lorrain)	Smooth brome	Crested wheat	Broadleaf Birdsfoot Trefoil
Row	1	2	3	4	5	6	7	8	9	10	11	12

Figure 8. Suggested planting for a grass nursery.

Care should be exercised to avoid planting the grass seed too deep. One-half inch is adequate depth for most grasses. It may be helpful to use a 1/2 inch pipe or iron rod that is 8 feet long to make the furrow in which you plant the seed. Lay the pipe or rod on the row to be seeded and slide it back and forth until it is completely embedded. Then lift it out of the row and you have a perfect furrow of uniform depth in which to seed the grass. Press the soil firmly over the seed. The nursery may be sprinkled if there is not sufficient moisture in the soil to germinate the seeds.

The grass nursery is a very informative part of the 4-H project. Keep records as to which grass came up first, which one formed seed heads first, and how early each matures. In the second year, record those which failed to survive the winter in a satisfactory manner and those which start earliest in the spring. All of this will help you to decide which grass you would select for specific purposes on your ranch or farm.

Sand Blow-out Control. The individual Range 4-H Club member is urged to work on the control of sand blow-outs. He may do this either as an individual or as a participant in a club or community project.

The objective of blow-out control is to stop the active movement of sand in the blow-out area and to establish a vegetative cover of grass and other plants that will prevent further blowing of sand.

The first step in controlling a blow-out is to fence it out. Eliminate the grazing animal during the late fall, summer, and early spring months. Scrape or level off the sharp edges of the blow-out into a gradual slope. It is the sharp embankments that give the wind its swirling action in the blow-out.

To eliminate blowing while the grasses are becoming established. Apply a temporary cover or mulch. This is sometimes accomplished by hauling in and spreading old hay over the surface of the ground. This is usually worked into the sand with a disk or tiller of some kind. It can be accomplished by feeding the hay to cattle on the area and letting them trample it into the sand.

If mature hay, which was stacked after the seed had ripened, is used, you can expect some grass to grow and become established from the shattered seed. In many cases this is the only seed applied to the blow-out. Better results may be obtained if rye and Madison vetch are seeded, before the cover is applied, to form a seedbed for the grass seed the next year.

Sand lovegrass and switchgrass seem to be best adapted to seeding in these areas. In some cases, other warm season grasses are effective but normally require a longer period of time to become established.

Sand blow-outs are most likely to develop in areas where cattle are concentrated. To prevent blow-outs from starting, attempt to avoid concentration of the livestock around windmills and in fence corners. Salt blocks should be placed away from water. Experiments show that cattle do not require water immediately after taking salt. Back scratchers or oilers should be located away from both watering and salting places. It is wise to change the location of salting places and back scratchers periodically to avoid starting blow-outs in the area.

Controlled Grazing Projects. If any one practice were to be named that would most improve the native rangelands of Nebraska, it would be controlled grazing. Normally, we think of two things when we say "controlled grazing" . . . rotation and deferment.

Rotation grazing consists merely of dividing the range pasture into two or more units. These are then grazed alternately and at regular intervals.

Deferred grazing can be called merely delayed grazing, since under a deferred system, grazing is delayed until the vegetation has reached a desired stage of development.

The most popular controlled grazing system in use today involves a combination of these methods and is called a deferred-rotation system. Under this plan the range pasture is divided into two or more units which are grazed in rotation. Along with this, grazing on one or more of the units is deferred until the plants are in a state of maximum production.

The diagrams which follow are controlled grazing plans for Nebraska rangeland:

	Spring grazing	Summer grazing	Fall and winter grazing
1954	Unit A	Unit B	Unit C
1955	B	A	C
1956	B	C	A
1957	C	B	A
1958	C	A	B
1959	A	C	B

Figure 9. A deferred-rotation grazing plan.

Study of Figure 9 shows that grazing on each unit of the range is delayed two years in succession. This situation would occur once every six years. This gives the seedlings which result from the first year seed crop a whole season to become established before being grazed.

	Spring grazing	Summer grazing	Fall and winter grazing
1954	Unit B & C	Unit A	Units A, B, & C
1955	A & B	C	A, B, & C
1956	A & C	B	A, B, & C

Figure 10. A deferred grazing system.

Figure 10 is a plan for a deferred grazing system. This system is somewhat easier to establish than the previous one. Under this system one unit is rested during the spring grazing season and two units are rested during the summer season. All three are used during the fall and winter.

It is interesting to understand the way controlled grazing systems work. There is no better way to learn about it than to make a map of your ranch. Plot out the various pastures and their present use. Show watering places, salt licks, roads, and other management features.

When this is complete, make another map showing how it might look after a rotation plan was put into effect. Such a map will give you some idea of the additional fencing and watering places that will be required.

This type of project makes an ideal demonstration to be given by the 4-H member.

Fertilization of Meadow Land

The use of commercial fertilizers for the improvement of meadow land is now being investigated by scientists at the Nebraska Agricultural Experiment Station. Preliminary results from this research indicate that we may expect satisfactory returns from applications of commercial fertilizer.

A very interesting program can be worked out for the club member who chooses this method of range improvement for a project. He can take soil samples and send them in to the Soil Testing Service for analysis. Small plots can be fertilized according to recommendations from the soil test.

Taking Soil Samples for Chemical Analysis. The reliability of any soil test depends upon how carefully the soil sample was taken. If the sample is not representative of the area to be fertilized, certainly the soil test will not be accurate.

The following steps outlined by the Soil Testing Service are designed to improve your sampling methods:

1. Information forms and mailing cartons are available at your county agent's office. Fill out the information sheet while taking soil samples.
2. Soils that are noticeably different in appearance, crop growth, or past use should be sampled separately.
3. Take a small sample, extending from the surface to a depth of six inches in at least ten places in each soil area. Mix all of the samples from one soil area and fill the carton with the mixed soil.
4. Be sure to number each carton and put your name and address on each.
5. Draw a map of the field and mark the location and number of each sample for your record.
6. Fill out the information sheet and mail in an envelope attached to the package containing the soil samples.
7. Samples should be packaged and wrapped ready to mail. Deliver them to the county agent's office. Payment of postage plus one dollar for each sample sent in should be made to the county agent.
8. Address the package to "Soil Testing Service, College of Agriculture, Lincoln, Nebraska."

Putting Out the Demonstration Plots. Establish two demonstration plots for each soil area sampled. If you sent in three samples you should have six plots. Each plot should be 10 ft. x 43.5 ft. or 1/100 of an acre. When the results of the soil test are returned to you they will be accompanied by recommendations. For instance, for Sample 1 they might recommend 40 pounds of available nitrogen and 80 pounds of available phosphorus per acre for the most successful production of grass-legume hay.

In terms of the demonstration plot which is 1/100 of an acre, it means that 2 pounds of a fertilizer containing 20% nitrogen and 40% phosphorus should be applied.

Care must be exercised to obtain even distribution of the fertilizer on the plot. Well-planned fertilizer plots make excellent demonstrations and projects because cost and yield information is easy to obtain.

Reference Material

It is suggested that the agent or leader, who is working with 4-H boys and girls in a Range Conservation Club make available to himself one or more of the following publications:

1. Manual of the Grasses of the United States. Second Edition, U. S. D. A. Miscellaneous Publication No. 200. Available by writing to U. S. D. A. Superintendent of Documents, Washington 25, D. C. Cost approx. \$3.00.
2. Nebraska Weed Bulletin No. 101. Published by Division of Noxious Weeds of the State Department of Agriculture and Inspection. Cost approx. \$1.00.

APPENDIX

Glossary

The following is a list of terms and definitions that are commonly used by people who work in the field of plant identification. This list is not complete but should assist you in training the 4-H Club member to identify grasses. Many of the terms will be illustrated as the manual progresses.

1. annual - a plant that goes through a complete life cycle in one year, an annual plant lives only one year.
2. anther - the terminal portion of the stamen which contains the pollen.
3. articulate - jointed; disarticulate - breaking apart at the joints.
4. auricles - ear-like appendages present at the base of the leaf blade on certain grasses.
5. awn - a long, slender, bristle-like appendage; a beard.
6. biennial - a plant requiring two years to complete its life cycle.
7. blade - the flat, extending, parallel veined portion of the grass leaf.
8. caryopsis - a fruit in which the ovary wall and seed coat are inseparable, the fruit of a grass is a caryopsis.
9. collar - the section of the grass leaf located at the junction of the blade and the sheath.
10. cotyledon - the first seed leaf of a plant.
11. culm - the stem of a grass
12. dicotyledon - having two seed leaves.
13. dioecious - male and female flowers are borne separately and on different plants as in buffalo grass.
14. floret - a small flower, usually refers to the flower of a grass.
15. glabrous - smooth, without hairs.
16. glaucous - possessing a white powdery substance on the leaves and stems.
17. glume - the two outermost bracts or leaves of the grass spikelet.
18. lemma - the lower of the two bracts enclosing the grass floret.
19. ligule - a membranaceous or hairy growth on the inside of the collar of a grass.
20. monocotyledon - having one cotyledon or seed leaf, characteristic of the grass family.

21. monocious - male and female flowers separate - but both present on the same plant.
22. palea - the uppermost or innermost of the two bracts enclosing the grass floret.
23. panicle - a type of inflorescence in which the rachis is much-branched, the spikelets are attached to these branches (rays) by short pedicels.
24. pedicel - the stem which attaches a flower or spikelet to the rachis.
25. pistil - the female portion of a flower, consisting of the stigma style and ovary.
26. prostrate - lying flat on the ground.
27. pubescent - covered with fine hair.
28. raceme - an inflorescence on which the spikelets or flowers are attached to the rachis by an unbranched pedicel.
29. rachis - the central axis of the inflorescence.
30. rhizome - an underground stem which gives rise to a new plant.
31. sheath - the tubular portion of the grass leaf which folds around or envelopes the stem.
32. spike - a type of inflorescence in which the spikelet or flower is attached directly to the rachis; without the aid of a pedicel.
33. spikelet - a unit of the grass inflorescence consisting of two glumes and one to many florets.
34. stamen - the male portion of the flower, composed of the filament and anther.
35. stolon - an above ground stem that roots at the nodes and gives rise to new plants, the runners of buffalo grass are stolons.

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