

SPECIAL REPORT:

GRASS: The Stockman's Crop How to Harvest More of It

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YES, GRASS IS A CROP – A CROP THAT RIVALS CORN, WHEAT, AND SOYBEANS IN IMPORTANCE. IT'S THE BACKBONE OF OUR LIVESTOCK INDUSTRY, AND ALSO IMPORTANT TO WILDLIFE, WATERSHEDS, AND RECREATION. IN THIS REPORT YOU'LL LEARN THE BASICS ABOUT GRASS AND WAYS TO MANAGE IT FOR DESIRED PRODUCTION.

DO YOU TAKE YOUR GRASS FOR GRANTED?

Almost everybody takes their grass for granted – and has for a couple of centuries.

Few of our early-day stockmen had enough time to look closely at their grass and think about its needs. The demands of pioneer life assigned their grass “crop” a low priority. The apparent endless growing energy of their grass gave these founding cowmen a false sense of security.

Not enough of our pioneer stockmen realized then or for that matter, even today that grass needs more than Nature’s allotment of rainfall in order to produce a bumper crop for livestock, our four-legged harvesting machines.

It’s been difficult for a society oriented toward cultivation to accept that management and the manipulation of foraging animals is the basic key to production.

Manage Your Grass

Experience with planted crops has naturally led many cattlemen to search for solutions to rangeland problems in the realm of fertilizers, mechanical equipment, and the like. The idea that grassland production could be increased via practical grazing management has, thank goodness, gained acceptance over the years.

But, the application of needed management has unfortunately lagged. Since the last ice age melted on its retreat Northward, the vegetation of North America has had several thousand years to adapt to a multitude of local climatic and soil conditions.

By the time European settlers turned out their cattle in the USA and Canada the most adapted grasses were already in place and flourishing.

These grasses had developed through “survival of the fittest” and were in tune with their environments. They were adapted to grazing and could survive drought, flood, fire, insects, and diseases. Millions of wild animals, from bison to elk, were supported by this grass.

When they were largely replaced by cattle and sheep the conversion was rapid and simple. We got off easy. Because, in some parts of the world the native vegetation often had to completely replaced before a livestock industry could prosper. Fencing of grasslands became widespread following the invention of barbed wire. This, however, was a two-edged sword.

Stockmen could then control the grazing of their cattle, and so better manage their grass efficiently. But, fences also established confines that permitted mismanagement that often led to deterioration of the native pasture.

Fences plus water developments were even more damaging to grassland, because this allowed the stockman to continue to graze during the drought conditions where under natural conditions the grazing animals either left or died when the water dried up.

The result: Due to either a lack of understanding or a low priority given to grass management, many ranges degenerated far below their pre-cattlemen conditions.

What a resource!

There’s a silver lining, though. Grass is a renewable resource. It’ll respond to a combination of management techniques so you can restore much of its original lost production.

The importance of grass management can’t be overstressed. Many cattlemen have spent nearly their entire lifetimes in livestock breeding and culling programs to increase herd production 20 to 30 percent. They then

also found they were able to increase stocking rates 30 to 100 percent through sound grazing management.

Your efforts to restore grass production need to begin with a solid grounding in the fundamentals of grass growth.

There's a natural tendency to search for exotic and often expensive methods of improving grasslands.

However, any innovation or practice that doesn't allow for the basic functions of grass growth to occur is incomplete.

Once you understand the basics, then you can apply the innovations toward your goal of measurable improvement.

Is cornerstone crop

Have you ever thought about just how important grass is? In most states West of the Mississippi and in a few to the East, grass is the foundation of the leading source of income: The sale of livestock.

But, in addition to production of meat, milk, and wool, grasslands provide other amenities important to us all.

Grasslands form vast watersheds that yield quality water for urban use. They're also important for production of wildlife. And, they're becoming recognized as sources of recreation and aesthetics.

There are more than 1,000 species of grass in the USA alone. And, in any given locality this number may vary from 100 to 200.

As a general rule, eight to ten of these species produce 70 to 90 percent of a locality's forage.

WHAT'S WHAT IN GRASS "ANATOMY"

Grasses, like people in crowds, look alike to the casual observer. But, also like people, grass plants have characteristics that set them apart as individuals or species. So, if you can tell different breeds of livestock apart, you can also easily learn to tell one kind of grass from another.

Want specific information? There are numerous manuals available for all areas of the country that'll help you identify your grasses. You can ask your Soil Conservation Service or Extension Service people for information and assistance, too.

If you're used to identifying garden plants by their color, odor, and shape of flower, identifying grasses may be slightly difficult for you at first.

Why? Because, grasses have no non-essential parts. Being wind-pollinated, their flowers need no bright colors, fragrances, or nectar to attract insects helpful in pollination.

How to ID Grasses

So, to identify grasses you instead need to look closely for differences such as height, shape of leaves, stems, hairiness, and seed heads.

The above-ground parts of a grass plant are divided into two parts: Vegetative and flowering.

The flowering parts are referred to as the inflorescence, and include seeds and their appendages.

The vegetative parts include leaves and stems that are usually round or somewhat flattened. Stems are generally hollow, although they're occasionally filled with a soft pith much like that of corn or sorghum plant stems.

Grass stems are jointed. Usually they're swollen at the joint or node. A leaf originates at each node, and leaves alternate on opposite sides of the stem.

Joints are short and compressed, giving rise to a cluster of leaves at the base of the plant. Joints and leaves tend to be further apart as they progress up the stem.

Grass leaves have two main parts, the blade and the sheath. The sheath clasps tightly around the stem, evaluating the blade. The blade is the portion that extends away from the stem.

A small membrane-like projection, the ligule, extends from the sheath. Sometimes called a rainguard, the ligule provides a small barrier at the base of the blade to keep dirt and rain from fouling the sheath.

The reproductive part, the inflorescence, is made up of many smaller units of spikelets. Spikelets are composed of florets or grass flowers.

The number of florets in a single spikelet may range from one, as in switchgrass, to 30 or more in some lovegrasses. At maturity the florets produce seed. Each seed is enclosed by two small leaf-like bracts known as the lemma and the palea.

In many grasses these bracts have a prolonged sharp extension called an awn. These awns cling to the hair of livestock and clothing, giving the seeds some mobility.

A few grasses have awns that are detrimental to livestock, through, because they can cause mouth ulcerations and eye irritations.

Each of these appendages – leaves, stems, and flowering parts has a function. Generally each differs somewhat from grass species to grass species. These are the

differences you can learn to use to identify the different grasses.

See Only Half

More than half of a grass plant's total volume is out of your sight underground in the form of roots and underground stems.

The main functions of the roots are to anchor the plant to the soil and to absorb

water and minerals. Perennial grass roots also serve as storage areas for plant food.

Underground stems or rhizomes are present in many grasses. They provide a vegetative method of reproduction as an alternative to seeds. These rhizomes sprout laterally from the parent plant to form new plants. They also store some plant food.

HOW TO CLASSIFY GRASSES

You can divide grasses and sort them into various "pigeonholes" in any of several ways.

First, you can sort them according to the season in which they make their major growth. Some grasses, for example, begin their growth early in the Spring when the soil temperature reaches 40 to 45 degrees F.

They complete their cycle during the cooler months before hot Summer weather sets in. and, they're usually partially dormant during the Summer months. So, they're called, naturally enough, cool season grasses.

These grasses are important in extending the period of green forage while the warm season grasses are dormant. They're valuable sources of protein and vitamin A during late Fall and early Winter and again in late Winter and early Spring.

Some cool season grasses are the wheatgrasses, bluegrasses, fescues, bromes, wheat barley, and other small grains.

The second main group of grasses is the warm season grasses. They begin their

surge of growth when the soil warms to 60 to 65 degrees F. These plants are adapted to higher temperatures, and can endure Summer heat. They complete their growth cycle in late Summer or early Fall.

Warm season grasses occupy much of our rangeland acreage, especially in the Great Plains area. These grasses include the grammas, bluestems, dropseeds, love-grasses, Buffalograss, and Indiangrass.

Some "come back"

Longevity is another way you can divide grasses. Some grasses are perennials that remain alive for several years.

These plants begin new growth each Spring from crowns and roots near the surface of the ground that have remained alive, but dormant over Winter. They grow and complete their cycles during favorable temperature periods, and then again go into dormancy to endure unfavorable Winter weather.

Grow from seed

Other grasses are annuals. Beginning from seeds every year, they produce roots, stems, leaves, and finally seeds, then die the same season.

However, there are some Winter annuals that begin growth from seeds in the Fall, go semidormant during the Winter, and then terminate their growth, after producing seed, the following Spring.

Grass height varies

You can further classify grasses according to their growth statures: Tall, mid, and short.

Tall grasses grow four to eight feet high. These grasses are usually abundant in higher rainfall areas East of the 98th meridian and on favorable sites along streams and moist valleys in the Western plains and mountains.

Our major tall grasses include Big Bluestem, Indiangrass, Switchgrass, Eastern Gamagrass, Prairie Cordgrass and Giant Sandreed in the Central and Eastern plains and areas Eastward of the Mississippi River.

Sacaton, Switchgrass, and Giant Dropseed are our major tall grasses in the Southwest Giant Wildrye, Basin Wildrye, Tall Oatgrass, and Common Reed grow in the Northwest and intermountain regions.

Mid grasses are intermediate in growth height. They vary from two to four feet in height. This is a large group of grasses that you can find over a wide portion of the Central and Western range areas of the USA and Canada.

Included in this group are Little Bluestem, Sideoats Grama, wheatgrasses, needlegrasses, wild ryes, Smooth Bromegrass, fescues, dropseeds, and Alkali Sacaton.

These From a Mat

Short grasses are generally grasses that grow less than 18 inches in height. They're low-growing, and usually form a mat that covers the soil surface.

In addition to being valuable grasses for grazing in the more arid Western portions of the USA, you'll also recognize them in lawns, parks, and golf courses.

Included in this group are Buffalograss, Blue Grama, Kentucky Bluegrass, Bermudagrass, Bahiagrass, Zoysia, Curly Mesquite, and Bentgrass.

NO ENERGY SHORTAGE HERE

Grass manufactures its own food in its leaves and stems. No, the old belief that food is drawn from the soil is contrary to what actually happens.

Science with all its startling discoveries and innovations still remains humble and awed by the ability of plant leaves to capture radiant energy from the sun and convert it into chemical energy.

This is the beginning of food – energy chain that nourishes all life. No other single chemical reaction is as important to our existence as this conversion process called photosynthesis.

Reaction is vital

How's it work? The plant draws water from the soil through its roots and transports it to its leaf cells. Carbon dioxide is pulled from the air through tiny pores on the lower side of the leaves.

There, in the leaves, green chlorophyll captures the power of sunlight. The leaves of the plants are in a sense the solar panels collecting the sun's energy to run the plant food factory. More leaves mean more solar "collectors" which in turn means more production. A series of chemical reactions takes place combining carbon, hydrogen, and oxygen into a simple sugar.

This basic source of chemical energy is then combined with other elements to form protein, carbohydrates, fats, and plant oils. The plant uses these elements to build new tissues.

It's these tissues that become either a direct source of food for man in the form of grain or are assimilated as roughage by livestock and eventually converted to food in the form of milk, meat, or wool.

Each year plants take in billions of tons of carbon dioxide and transform it into plant material. In the process they discharge a byproduct, oxygen, that sustains animal life on earth.

HOW GRASS SHOOTS UP

All plants have an area of growing tissue called a "growing point". This is where new cells are developed.

Grasses differ from most other plants in the location of this growing point. Trees, shrubs, and forbes grow from the outer tips of their branches. But, the growing point of a grass is situated at the base of the plant. New leaves are pushed upward from this point. Not until the grass plant issues a seed stalk does this growing point come within reach of a grazing animal or chance removal by a mower.

Because of these growth characteristics, grasses are better equipped to withstand grazing and recovery than most other plants. As long as this growing point

remains intact the grass plant will continue to issue forth leaves, stems, and finally a seedhead.

Where's this growing point? In grasses you can always locate it just above the last completed joint of the stem.

In young grasses and in new growth of perennial grasses, the joints are crowded together near the soil surface. A leaf arises from each of these joints. There may be ten to 15 joints in the first inch of stem.

Is Critical Time

As the growing season progresses the joints on some of the plants begin to elongate and push upward to produce a

seed stalk. At this time the growing point is placed in a vulnerable position.

Haven't you ever pulled the seed joint of grass and bit the tender stem base? This tender, succulent portion of the stem is made up of newly formed tissue. It includes the growing point.

Only a small percentage of the plants of a perennial species attempt to produce seed in any one year. This is a protective device.

The remaining plants wait for succeeding years before attempting to produce seed. This is a marvel of nature and akin to the old proverb about not putting all your eggs into one basket. This way not all the plants are in a vulnerable position at the same time.

Push to Sunlight

Most highly productive forage grasses elevate their growing tissue at some time during the growth period. This places their upper leaves in a higher position. The result: There's more direct sunlight on the plant's solar "collector's for maximum food production.

This, plus the resulting shading effect, gives taller grass an advantage over shorter plants.

But, when you remove growing tissue by grazing or mowing, growth from that stem is stopped. New growth then has to begin from a dormant bud located at the base of the plant. This is similar to what happens in Spring "greenup"

The growing point of short grasses and successful lawn grasses remains near the surface of the soil at all times. It's never

in a position to be removed by livestock or mowers.

The seedhead is elevated by one large, long joint extending upward from the soil surface. An animal may graze off the leaves without removing the growing point.

So, the plant continues its growth except for a temporary slowing if you remove too many leaves at one time.

Like any living organism, certain natural growth sequences must take place in grasses if you're to obtain optimum forage yields. These include leaf development, root growth, seed production, and food storage.

The first growth that perennial grasses make in the Spring greenup comes from food stored in roots, underground stems, and crowns.

This stored food nourishes the newly-emerging leaves until enough leaf area is developed to manufacture and supply food to the young plant. Of course, as additional leaf area develops, food production is accelerated.

This manufactured food is then distributed rapidly through the plant to feed its growing portions. Most of it is used for developing more leaves and increasing the size of the plant exposed above ground.

The rest is used to grow more roots and extend their depth. This enables the plant to absorb a greater volume of moisture.

When time and conditions are right for stem elongation and seed development,

leaf and root growth are somewhat halted.

Must reproduce

Growth activity then concentrates on rapidly completing the reproductive appendages, the seeds. After the seeds develop, the manufactured food is pumped from leaves to roots and the plant's lower portion for storage.

This stored food nourishes the roots during Winter, keeping them alive. But, its main function is to supply the energy to initiate new, vigorous growth the following Spring – and renew the bounty of Nature.

This requires a strong, healthy, vigorous plant at all times. You can liken this to a healthy, vigorous cow being better able to produce a strong, lusty calf that grows rapidly.

PASTURE MANAGEMENT IS REALLY LEAF MANAGEMENT

It's extremely important that enough leaves remain all during the growing season to manufacture food. Many factors influence how much a plant grows: Rainfall, temperature, soil depth, soil texture, fertility, topography, and the inherent ability of the plant itself.

Yet, even when these factors are optimum, a plant can't grow without a large enough food producing factory – its leaves.

This is the crux of grass management. The only major factor affecting grass growth that's fully in your control is the maintenance of the size of the leaf area, the plant's solar energy collectors that run the "food factory".

Leave Half!

Except for grass you fertilize and irrigate, all other growth influencing factors depend on Nature's provisions. Overgrazed grasses simply can't remain healthy, vigorous, and productive any more than a feedlot steer can gain well on only a maintenance ration.

This point, simple as it sounds, is something you just can't over emphasize.

The effect of leaf defoliation on plant development has been studied many times. In general, there's agreement that grass production is substantially reduced when you remove more than half the leaf volume by grazing or mowing during the growing season.

Long ago, successful cattlemen coined the phrase, "Take half and leave half".

A later adage, "The half you take will gradually get bigger," is one key to greater production.

An increase of one or two leaves on a grass plant when multiplied by millions of plants is the story of enhanced forage production in a pasture.

Good roots essential

Root systems are the unseen, but vital supply lines of moisture and minerals to the plant leaves. The depth that roots penetrate the soil varies between different species.

Roots of many tall grasses, such as Big Bluestem, reach down ten to 14 feet. Grasses with shorter growth characteristics, such as Blue Grama or Buffalograss, may send roots to a four to six foot depth.

To some degree, the volume of roots and the volume of leaves produced are in proportion.

It takes an extensive root system to supply water to a large volume of leaves. Depth and volume of roots are greatly influenced by grazing management. Scientific studies point out that excess removal of leaves has an adverse effect on root development.

Each year a portion of a grass plant's roots die and are replaced with new roots. This is a natural function. It's called natural pruning.

WHY 30 PERCENT OF ALL GRASS ROOTS MUST BE REPLACED ANNUALLY

The amount of annual replacement varies with different grasses. But, it ranges from 20 percent to 50 percent of the total root system. It's necessary that these roots be replaced if the plant is to remain healthy and productive.

In one comprehensive test in which the effect of leaf removal on root development was studied, it was found that in all grasses the amount of leaf volume removed had a direct effect on the growth of new roots.

All root growth stopped for 12 days when 80 percent of the leaves were clipped. Removal of 90 percent of the leaves stopped all root growth for 18 days.

And, these roots didn't again resume growth until the leaves were once more actively growing. The effects of repeated clippings were much more severe, too, and the duration of root growth stoppage was increased.

When just 60 percent of the leaves were removed only half of the roots ceased to

grow. And, when only 50 percent of the leaves were removed almost all the roots continued growing actively.

This really emphasizes how true, "Take half and leave half" is.

A grass plant produces twice the volume of leaves that it needs to complete its growth functions and remain productive.

But, if you remove more than half of its leaves during the growing season you deprive the plant of part of its food processing mechanism. And, production of plant tissue – forage is reduced accordingly.

North America was originally blessed with extensive natural grasslands stocked with an abundance of palatable, productive grasses.

In spite of the fact that much of this land has been converted to producing grains, rangelands still occupy the largest single category of land use in most of the North America continent.

HOW GRAZING AFFECTS ROOT GROWTH

Percent leaf Volume removed	Percent root growth stoppage
10%.....	0%
20%.....	0%
30%.....	0%
40%.....	0%
50%.....	2-4%
60%.....	50%
70%.....	78%
80%.....	100%
90%.....	100%

This table illustrates the truth in the old saying. “Take half and leave half”. Notice that as you graze off up to half the leaves of your grass that root growth continues unimpaired. But, just look at what happens when you try to sneak in another ten percent “harvest”. Half the root growth is stopped. At 80 percent root growth stops completely – and at least 30 percent is needed annually to replace roots naturally pruned. Removing 80 percent of the leaves also stops root growth for 12 days. Taking off 90 percent of the leaves stops root growth completely for 18 days.

- A. Although you may think you see quite a bit of “daylight” between grass plants in even your best pastures, actually the plants are properly spaced. Notice how the roots intermingle and the leaf canopy prevents sunlight from reaching other plants such as weeds.
- B. Each year approximately 30 percent of each grass plant’s root system must be replaced. What happens if you overgraze and the plant’s root system not only can’t expand, but can’t replace that vital 30 percent natural loss?
- C. Weeds can take hold and grow where grass roots have been too severely weakened. Weedy pasture is less productive pasture.

CAN YOU SET UP A MANAGEMENT PROGRAM?

Volumes of research on composition, growth, and techniques of management have been published. Yet these grasslands are still largely underrated in production potential – and undermanaged for the most economical returns.

Unlike most agricultural crops, grass is relatively permanent. You don’t need a lot of machinery, seed, or expensive fertilizer to manage grass.

So, our grasslands don’t get the constant publicity and support of company sales representatives. Advertising programs for good range management are essentially nonexistent.

As you know, it’s hard to compare one livestock operation with the next. Pastures vary in size, soils, topography, and kinds of grasses produced. Stocking

rates and livestock management also differ greatly from place to place.

That's why news about new management techniques for better production efficiency about grass travels rather slowly.

Contrast this with how fast the news about how to increase corn or wheat yields via a new innovative spreads and is adopted around the country.

This means the search for better grazing management is largely up to your own efforts. You can get some assistance from the SCS and Extension Service and numerous consultants are available.

Your management problems wouldn't be so tough if climate, vegetative

production, and market conditions were stable from year to year. But, they aren't.

Survive drought

When a prolonged drought changes to toad-strangler rains and markets go from boom to bust within a year, management good management becomes the art of survival.

Your first step in a management program should be to set some realistic goals: Income, type of operation, kinds of livestock, and relative numbers. Then inventory your forage resources. Explore and develop ways to overcome your grazing problems .

WHAT YOU CAN LEARN FROM LIVESTOCK GRAZING HABITS

How your cattle or sheep graze is influenced by a number of things: Types of vegetation; topography; location of water, salt, and minerals; shade; prevailing wind directions; and routine grazing habits.

Cattle range widely

On the average, during a 24-hour Summer day a range cow spends six to ten hours grazing while traveling two to five miles. She'll spend a little more than 12 hours or half of her day resting and ruminating.

During the rest of her 24-hour day a cow will travel, drink water, lick salt and minerals, and rub and nurse her calf.

Cows generally have two main grazing periods. One is from sunrise to midmorning. The second is from late afternoon until sunset.

However, short sporadic grazing periods at other times aren't uncommon. Cows may also graze for a short period during the night.

How long cattle graze is generally determined by the temperature. Usually they'll spend more time grazing on cool, cloudy days than on hot days.

Cattle prefer to graze level areas rather than hilly, rocky terrain. So, most pastures have variations in topography that affect cattle grazing routes.

Portions of a pasture may be heavily used, while other portions may be only lightly grazed by your cows. You can overcome most of this distribution problem by careful location of water, salt, and mineral facilities. You may even have to resort to fencing to even up grazing distribution.

Cattle usually travel to water to drink twice daily. If their water supplies are limited, they'll have to return to the same areas twice each day. This usually results in spots of overgrazing.

As a rule, cattle go to salt and minerals once a day. And, it's been proved that salt locations don't have to be located near water.

Four to eight hours generally elapse between taking salt and watering. So, this means you can use salt locations as a grazing distribution incentive for cattle.

Locate your salt and mineral feeders in areas that are more lightly-grazed than normal. This is usually a considerable distance from water. Putting your salt boxes near water only intensifies grazing in that area.

Because most breeds of cattle have few sweat glands, they rely on wind to circulate air around their bodies for cooling. That's why cattle prefer to keep either their sides or muzzles toward the

direction of the wind most of the time while they're grazing or standing.

South is popular

In the Great Plains, for example, the prevailing Summer winds are from the South or Southwest. The South half of any pasture is usually grazed more heavily than the North half due to this tendency of cattle to graze into the wind.

Cattle, like you, have certain foods they prefer. They'll almost always eat certain grasses first. Often a preference for a particular type of plant will change as the grass reaches a different stage of growth.

Selecting one kind of grass over another during the growing season has a profound, long-term effect on the makeup and production of a pasture. This results in a competitive advantage for the plants not liked so well. When the leaves of a grazed plant are removed to the point that growth is retarded, the plant loses its battle for light and moisture to less palatable, ungrazed plants.

The consequence: Gradual weakening and thinning of preferred plants with less desirable species taking over. Carried to extremes, overgrazing for years can change a prime pasture into one of low-productivity and less desirable forage.

HOW TO CARRY MORE LIVESTOCK ON THE SAME NUMBER OF ACRES

Then how did Nature handle this selectively situation when the number of bison in the Great Plains alone ranged upward to 50,000,000 head?

Remember that bison were migratory in their grazing habits. Although they

grazed in large herds, they continually moved to new areas.

After the herd passed even the most palatable and the preferred plants had a period to renew their leaf volumes and remain in a healthy, vigorous state.

This concept has triggered many cattlemen to devise grazing plans simulating the original natural program. For stocker operations, rest periods can easily be provided by going to market early. But, with cows where year round forage is required some form of planned rotation is needed.

Numerous terms have been used in describing the idea: Rotation grazing, rest rotation, deferred rotation, or planned grazing.

Regardless of name, the method has had surprising results in increasing plant vigor and production.

Rest, recovery vital

Basically, the success is due to the provision of allowing rest periods for the grasses. A rest period during the growing season allows all grasses, even the most palatable, time to regrow and stay healthy and productive.

Ideally the period of rest will occur at a different time each succeeding year. And, as an illustration, the most simple system would involve the use of two pastures.

Call these pastures A and B. Put into one herd all the cattle normally carry on the two separate pastures. (You can use more than two pastures)

Then graze Pasture A the first half of the growing season and Pasture B the last half. This rests B during the early part of Summer and A during late Summer.

The next year reverse your system. Graze B the first part and A the last part of the Summer to complete the cycle.

What happens: You'll have provided the equivalent of a year long rest for each pasture during the two year period while at the same time grazing your normal number of cattle.

And, your grasses will have responded to these rest periods by increasing their leaf and root volumes. The payoff is greater production. You should soon be able to carry more cattle.

You have many things to consider in designing your grazing system. This includes the number size, and location of your pastures; kind of livestock; kind of grasses; water; and topography.

You may work up a two pasture, three-pasture, four pasture or even eight-pasture rotation system. You might set up one to three different herds, too. There can be many modifications, as you'll note from the examples.

These are the major benefits from such a grazing system in your program:

1. Increased vigor of your grasses. This results in increased production.
2. Less selectivity or grazing preference by livestock for certain grasses.
3. Better grazing distribution by your cattle over a pasture.

4. Less labor and fuel expense since your cattle are grouped in fewer pastures.

Although they're not the complete answer in themselves to grazing problems, grazing systems do alleviate some of the biggest forage problems you face. However, practicing the old adage of "Take half and leave half" is still essential for any grazing system to succeed.

Design your grazing system to involve all your forage resources within an operating unit.

Key entire program

This may involve only rangelands. Or, it may include use of both rangeland and seeded or special purpose pastures such as Fescue, Bromegrass, or Wheat grass for early Spring and Fall grazing.

Bermudagrass, Bahiagrass, King Ranch Bluestem, Weeping Lovegrass, and Indiangrass are special purpose pastures

CONTROL BRUSH AND WEEDS

There's been a gradual invasion of brush and weeds into many of our grasslands. In fact, in some areas brush has become the number one pasture problem. And, brush continues to gain new footholds just about every year.

Nature's most effective tool in managing the spread of brush was fire, especially in humid and sub-humid areas. Fueled by luxuriant stands of grass, intense fires consumed trees and shrubs and prohibited their establishment.

you can use to supplement your rangelands during Summer months, depending on your local area.

You'll need some finesse and planning to set up a sound, long term forage program.

Drought may throw the biggest monkeywrench into your plans. But, most grasses entering a drought in a thrifty, vigorous condition have built-in reserves enough to endure one or possibly two years of heavier than normal grazing without any large losses.

There are also some other things you can do to build and maintain overall grass health:

Crossfencing, additional water facilities, seeding retired cropland and depleted rangeland to grass, developing special purpose pastures, and controlling brush and weeds will help you maintain and improve your pasture "crop".

But, wildfires are much less frequent today, thanks to greater highway and road development and more cultivation. As the effectiveness of wildfires diminished, other methods of control were employed.

Once established, though, most brush species are extremely persistent, and some form of control is usually necessary to initiate and speed grass recovery.

Mechanical methods have proved effective for reducing many kinds of brush. These include mowing, bulldozing, root plowing, chaining, chopping, and sawing.

More rely on burning

The use of fire is making a comeback as more and more managers are now using “prescribed burning” in their brush control programs.

Properly planned and conducted fires are an efficient and economical method of control. Adequate amounts of fuel, proper timing, safety precautions, and experience are essential ingredients in a successful burning plan.

You can also use hormone herbicides successfully to control many brush and weed species.

Chemicals are common in nature and many plants inhibit the growth of other plants by exuding toxic compounds. This is referred to as “allelopathy”.

Many of these natural toxins have been synthesized into commercial herbicides. Herbicides can be applied as foliar sprays, pellets, or rubbed on with wicks. They can also be spot-treated with injectors, jets, or special guns.

You need to give special emphasis to the targeted species in selecting the right herbicide, rate and method of application, and weather conditions.

Brush control results can be quite variable. Complete eradication seldom, if ever, can be accomplished.

Opens shade canopy

But, treatment does reduce the competition for moisture and opens the shade canopy. This helps your grasses reestablish themselves.

To improve effectiveness, many operators are now integrating their brush and weed control programs and using combinations of treatments. Over the years this may involve a sequence of herbicides, mechanical treatment, and fire on the same acreage.

You also may want to consider “co-grazing”, or the combining together of a cattle herd with a sheep or goat block in your grazing program, as an increasing number of livestockmen are doing. Sheep and goats will control some weed and brush species.

SHOULD YOU LOOK AT OTHER GRASSES

Many cultivated or introduced grasses can provide your livestock with excellent supplemental grazing. You must properly fit them into your grazing program, however.

Caution: These grasses have been overemphasized as all-purpose forage. Their real value and successful use has been as supplemental forage used to extend the green forage period.

Promotional efforts in some parts of the country have led to widespread replacement of rangelands with introduced grasses.

Need some care

However, take care, because most introduced grass pastures are really effective only when used for short, specialized grazing periods. They also require annual fertilization and some renovation.

When fertilizer costs are relatively low and livestock prices bullish, it may look to you that such a conversion is a good idea. But, when fertilizer costs zoom and livestock prices drop the situation changes fast.

There's a drawback

There's also another drawback. Establishing so much pasture containing just a single grass species approaches what's called a monoculture situation. What if an insect or plant disease outbreak is specific for your one variety?

Your pasture system will be most efficient when you have a variety of forage sources available and balanced into a grazing plan sequence. This will also give you more flexibility of herd management and marketing dates.

Cool season grass pastures are excellent for early Spring and Fall grazing. But, they become semidormant during the warm Summer months. Growth ceases and your cattle gain less.

If you have some warm season grass pastures either in rangeland or seeded pasture your livestock probably can continue gaining well without the typical Summer pause.

Supplemented with protein concentrates, most warm season grasses can provide a low-cost Winter forage for livestock in many parts of the country.

YOUR MOST IMPORTANT RANGE MANAGEMENT INGREDIENT: ACTION

Really, management of rangelands is relatively simple once you understand and follow the basic fundamentals.

Work with Nature

All management begins with knowledge, is propelled by decision-making, and is improved with experience. Management of rangelands differs in concept from working with introduced or tame pasture management.

Range management is actually the art of working with Nature.

It's working to maintain an ecological balance – balancing grazing with production. Your rangeland management primarily involves grazing manipulation rather than intensive agronomic practices.

Your first prerequisite is a grazing scheme to maintain your forage plants in high vigor. The stage that follows in natural sequence is a gradual shift in the kinds of grasses toward restoration of the original native grass composition and productiveness.

It's not uncommon for two side-by-side pastures to vary in production by 20 to 40 percent, even though similar in size, soils, topography, and kinds of grasses. This difference is solely due to the health and vigor of the plants. With sound grazing management you can usually restore vigor to an overgrazed range in one to three years.

Once you restore vigor, then the stage is set for the more productive grasses to enlarge in size, increase in numbers, and crowd out less desirable plants.

Just keep in mind that this process is a gradual, patient transition unmarked by sudden surges. Many positive, though subtle, things are happening as ranges improve.

Increased plant vigor means better protection to the soil surface and assures greater root volume below. Action of soil organisms gradually improves soil fertility and organic matter increases. A greater amount of the rain that falls enters the soil, less is lost as runoff, and so more moisture is available for plant growth.

You may not notice year-to-year changes. But, a two or three year span may reveal striking changes in increased production.

Grass is THE crop

Many cattlemen view livestock not grass as their base crop. But, in spite of her wonderful ability to utilize roughage and convert it to a usable food for man, a cow is still just a harvester and converter.

Although she requires considerable management attention, including breeding, vaccinating, spraying and marketing, a cow's basic need amounts to eating a given volume of forage every day. The same applies to sheep, of course.

Like crude oil is to a refinery, grass is to a cow. Grass, the raw material of the livestock industry, is your most important crop!