A
though native vegetation provides the bulk of live-
stock forage on most ranches, introduced pastures

can be important and economical sources of supple-
mental forage. However, many ranchers are too concerned
about forage production from a specific kind of pasture and
not concerned enough about how pastures fit into the total
ranch plan. How much forage a pasture will produce is only
one of many questions to ask in ranch planning and is not
even the right question to ask first.

The best forage and livestock combination and the best
ranch management plan must be developed by ranchers
for their own ranches. Only the rancher knows the unique
set of objectives and needs. After you decide the forage
limitations of your own ranch, talk to local extension or soil
conservation agronomists and learn which forages are
adapted to your area. It’s critical that ranchers accurately
assess their needs and then tell the pasture specialist what
is needed and not the other way round.

Therefore, I emphasize only general and fundamental
considerations for different forage systems and refer you to
specific forage species adapted to your local conditions.
With these general guidelines in mind, you should be able
to identify the kinds of forages you need.

The Right Questions

Four basic questions to help us choose the most appro-
priate supplemental pasture species include: 1) What do
we want from our ranch?, 2) What resources are available
on our ranch?, 3) What different kinds of forages are need-
ed to supplement our native range?, and 4) How can differ-
ent forage systems fulfill our management objectives and
livestock needs?

Ranch(er) objectives

The first question concerning ranch(er) objectives often
does not receive the necessary attention for several rea-
sons. Ranchers are often so busy with the every day
chores they don’t take the necessary time to think about
their long-term ranch (and forage) needs. The goals of par-
ents or current managers may not be the same as those of
their children or future managers. As we get older or richer
or poorer, our real objectives may change without us recog-
nizing the change.

In any case, the objectives of the ranch owner or manag-
er are important for the selection of the best forage system.
All objectives must be considered, agreed upon by all con-
cerned, and put in their proper priority. If there is to be a
good measure of success in ranching, the results have to be
compared to the objectives. This is especially true with
forage systems. Many ranchers have high regard for forage
crops and pastures; many others regret the day they even
considered planting forage crops. The difference is gener-
ally because the particular forage crop did or did not help ful-
lfill the rancher’s objectives.

Of the many objectives ranchers can have, four seem to
be universally common. These include 1) net profit, 2) pres-
tige, 3) management ease, and 4) ranch stability.

Net profit.—We all know the difference between "net prof-
it" and "gross profit" is the "cost." Unfortunately, not many of
us know what our total costs are. Since pastures cost
money to produce and affect the total ranch operation, total
ranch costs with and without supplemental forage must be
calculated.

Both gross profit and costs must be determined on a total
ranch basis rather than a per-acre or pasture-only basis.
What may seem profitable on a per-acre or pasture basis
may actually be at the expense of some other part of the ranch operation.

On the other hand, a particular pasture may not seem profitable, but if the additional forage production or quality provides greater net profit from the total ranch, that pasture actually is profitable. We should also remember that maximum forage production is rarely maximum net profit. Knowing the actual benefit:cost ratio of additional pasture production will help determine maximum net profit and optimum forage production.

Prestige—Prestige may be evaluated in terms of large numbers of cattle or sheep, fine horses, "pretty" hills, white fences along the highway, big ranch houses, and in many other ways. Unfortunately, without big net profits, prestige usually means big debts.

It is not my place to judge a rancher's objectives or to try to impose my values on anyone else. Instead, the obligation of ranch consultants and extension specialists is to help ranchers achieve their objectives while improving or maintaining the land in good condition. Regardless, one way of having prestige at less cost is to substitute pride for prestige and try to impress only those who recognize and value good management. Prestige is a common objective, but long-lasting prestige is easier to obtain when profit and pride allow you to survive and buy other prestigious ranches at bargain prices.

Management ease—Management ease, as a valid rancher objective, may be difficult to understand, but most ranchers certainly appreciate its importance. Management ease might mean minimum livestock movement, minimum maintenance of fences and developments, uniform labor requirements throughout the year, little or no supplemental feeding, or little farming unless someone else does it.

For older ranchers who have worked hard all their lives and have no one to leave the ranch to, a simple forage system may be best. The simple system may also be best for ranchers who do have heirs, but the heirs do not have the management ability or work ethic the rancher thinks they should have. For ranchers who cannot afford or cannot find dependable help when they need it, a complicated forage system can cause a lot of grief and waste money.

Ranch stability—The 4th objective, ranch stability, is also very real and critical. Today the economics of livestock ranching are causing many ranchers to wonder how long they will be in business. Although forage systems may not increase livestock prices, the optimum forage system can help reduce fluctuations in seasonal and annual forage production and in livestock sale prices.

Ranchers with limited cash or credit cannot afford to buy expensive feed during droughts nor can they afford to buy expensive replacement heifers during the wet years. Ranchers who plan for long-term ranch development and herd improvement cannot afford to sell good cows one year and buy them back the next year.

Existing ranch resources?

Once we decide our objectives and their priority, we then need to determine the ranch resources and opportunity for adding supplemental pastures and forage crops. The major resources to be evaluated include management, land, livestock, and developments.

Management/labor—Management includes the ability, knowledge, and interests of the owner or ranch manager. It does little good to recommend supplemental pastures if the manager does not understand or is not interested in managing the pastures as they should be managed.

All introduced pastures require a particular kind of management and only a few of them can be managed like rangeland vegetation. Labor might also be included in management. Pastures need to be fertilized or mowed for hay at a certain time and in the proper manner. If none of the cowboys want to ride a tractor, you may need to find some new cowboys—at least during the time the necessary farming must be done.

If there are farmers in the area, they might farm part-time on your ranch. Or, for certain crops on their place, farmers might lease grazing rights to you during early growth or on the stubble after harvest.

If the pastures which can optimally supplement your existing forages are to be selected, the production, quality, and dependability of the existing rangeland vegetation must be determined. The forage limitation most critical for the total livestock operation is the limitation to be corrected first. Certain kinds of forages may be easier to grow or manage or produce more biomass, but it's nearly always most economical to provide the most critically needed forage first before growing forage that cannot be optimally utilized.

Land.—While deciding the native forage limitations, also consider the production potential of existing crop and pastureland. A soil scientist or soil survey map can help locate which soils will be best for permanent pasture or annual for-
age crops. Consider not only the soil depth, fertility, slope, and other farming factors, but also where those soils are located in relation to surrounding native rangeland.

Generally, it's best to farm the most productive soils first; however, this is not always the wisest choice. Less productive soil located in the right place on the ranch may be better than more productive soil located in the wrong place.

The total grazing potential of each supplemental pasture area is also important. A small area of productive soil may not be large enough to be an economical grazing unit. In nearly every case, supplemental pastures must be fenced separately from native range and other kinds of introduced pastures because each kind of forage requires a different kind of grazing management for optimum returns.

Livestock.—An accurate evaluation of existing and future livestock needs is just as important as the land characteristics and potential. Good quality forage may be wasted on low quality livestock and good quality livestock may be uneconomical on low quality or inadequate forage. The existing grade of livestock and the opportunity and desire for livestock improvement will influence the best kinds of forages to grow.

Livestock nutritional requirements vary with kind, class, body conformation, and physiological activity. Usually, the optimum kind and class of livestock on a ranch are determined by the characteristics of the rangeland; however, supplemental pastures allow you much more flexibility and more opportunity for livestock diversity and improvement. Sometimes the optimum number of animals on the ranch is limited by something other than forage supply or quality. In these cases it is seldom economical to produce more forage than the livestock need, unless hay is sold.

Developments.—Ranch developments, including water, fencing, and corrals, should also be considered. Livestock water supply may be a critical factor. If a particular area has only enough water for a certain number of animals during a certain season, increased forage production above the water supply for those animals may be wasted.

If high forage production can be obtained at a low cost, it may be economical to haul water to more animals or provide water by some method normally considered to be too expensive. If adequate water is available only during certain seasons of wet weather; select the forage which can best be used during those seasons. When land preparation (e.g., terracing) is necessary, design the land treatments to increase livestock water supply as well as facilitate farming, reduce erosion, and increase soil water.

The opportunity for developing irrigation water, at least during the period of critical plant growth, or otherwise increasing soil water should be determined. Many lower slopes and valleys in a watershed can be seeded and then watered from upslope reservoirs. These upslope reservoirs can also help reduce the danger of floods washing out expensive pastures and fences.

Many pasture and forage crop varieties have high moisture requirements for maximum production and utilization of fertilizer. Therefore, available soil water for pastures in arid lands is usually the most critical factor. The cost of pasture development must be compared to the increase in total ranch profits.

The existing and necessary additional fencing and other livestock handling facilities will also affect the location and total cost of supplemental pastures. Occasionally the cost of fencing pastures can be greatly reduced if there is limited livestock water in the area of the pasture. If a well or reservoir in or near the pasture can be shut off or fenced, the distance from other water may prevent livestock grazing the pasture until the proper time when drinking water is made available.

Kinds of Forage?

Three general kinds of supplemental forages include "Rangeland Pasture," "Intensively Managed Pastures," and "Annual Forage Crops." Some people use different names and different concepts, so the exact name doesn't matter. Rangeland managers use these categories because they fit into our management planning.

Rangeland pasture.—Of the three kinds of supplemental forages, rangeland pasture is most like native rangeland vegetation. Both are ecologically adapted to the climate and to the soil. Both are managed by ecological and grazing principles rather than by agronomic principles. Rangeland pasture species are perennial, long-lived plants (e.g., wheatgrasses) which require little or no additional treatments, such as fertilizer, irrigation, or mowing, after the initial establishment.

Rangeland pasture requires the least maintenance, the least farming, and the lowest annual costs. These pastures are usually planted as a single species which responds much like a lower successional stage, native species. Consequently, rangeland pasture species are usually palatable for only a few months a year. Utilization of these species is most efficient when animals are allowed no other choice.
Forage production without fertilization is about as high as from good quality native vegetation and much higher than from poor quality rangeland. These species do respond to fertilization, as does any other 'weedy' range species. Fertilization of rangeland pasture is usually economical under favorable growing conditions, but uneconomical in dry years.

These species also are generally resistant to close grazing. Therefore, if overgrazing is necessary, it is better to overgraze the rangeland pasture than the native vegetation. Because these pastures often have about the same growth pattern as the native species, rangeland pastures are generally used to provide additional forage in areas where or when additional forage is needed. Livestock production from rangeland pastures is more dependent on forage production than on forage quality.

**Intensive pasture**—Intensively managed pasture species (e.g., legumes, bromegrasses) require better soil, more fertilizer, more labor, more livestock movement, and more management attention than rangeland pastures if the greatest benefits are to be obtained. With proper management both forage production and livestock production are much higher on intensively managed pastures than on rangeland pasture.

Intensively managed pastures provide a high benefit:cost ratio if well-suited to the overall ranch plan and are properly managed; however, the benefit:cost ratio can be very negative if they do not fit the ranch forage system needs or they are poorly managed. In other words, intensively managed pastures are more of a gamble if not wisely used.

If these pastures are not properly grazed, they mature quickly and become relatively unpalatable. When this occurs, much of the extra forage and management costs are wasted. One alternative is to mow the excess forage for hay before it becomes unpalatable.

Because the change in forage production and quality can be very rapid, a manager must pay close attention to intensively managed pastures. The downside of intensively managing these pastures may be that proper attention (e.g., irrigating when needed) to these pastures causes the manager to neglect other important ranch operations (e.g., fixing fence to keep the neighbor's bull out).

Different species can be selected to provide high quality and high production for a short period of time or lower quality and high production over a longer period of time. However, there are no species which provide both high quality and high production for a long period of time without intensive management and good growing conditions for regrowth.

Generally high quality perennial species are not well adapted in areas where rapid growth is followed by hot weather, and irrigation water is not used. In semi-arid areas, production usually depends on the species selected and amount of fertilizer and soil water used. Forage quality will depend more on the species selected, the stage of growth or regrowth, and kind and timing of fertilizer used.

**Annual forage**—Annual forage crops require the most farming and the best soil. Soils should have good soil water capacity and availability throughout the growing season, and be fertile with minimum erosion potential.

There are many different kinds of annual forage crops which provide at least some grazing during one or more seasons. These vary from high quality to high production depending on the species and variety selected. Some crops, such as wheat, may be grazed early in the growing season or on the crop aftermath, but, at high elevations or northern latitudes, rarely during the growing season it grain is to be harvested. Annual forage crops are best suited for specific needs and seasons.

Unless irrigation water is provided, there is a wide fluctuation in annual establishment success and forage production. Because of the effects of one or two years' seeding failures on stand establishment costs and on erosion, good seed and good seedbed preparation are critical. Do it right the first time or else farming time, fuel, seed, and confidence are lost.

**The Right Mix for Our Needs**

After the objectives, available resources, and the characteristics of potential pasture and forage crop species are determined, it should not be too difficult to decide which species will be most useful. On most ranches, 10 to 20% of the total ranch area, depending on suitable soil, will probably be the maximum amount of supplemental pasture needed.

It's wise to spend several years developing the total pasture needed. This allows time to learn how to manage the pastures, improve the livestock, and gradually change management operations. Also, very few perennial pastures can be grazed in the year of establishment. Full production from a pasture may not be reached in fewer than 3 or 4 years if growing conditions are unfavorable. Depending on how critical the need is for supplemental forage and how good our management is, the cost of pasture establishment may be recovered in as few as 2 years or as many as 10 years.

**Drought**—For cow/calf or ewe/lamb ranchers, there are many major needs for supplemental forage, but one of the most critical is certainly additional forage for drought flexibility. Forage quality will not be as critical as forage production during these times, so rangeland pastures or intensively managed pastures which provide high forage production during the expected dry season(s) will be most important. Because supplemental pastures cannot solve all of the drought problems, normal drought procedures such as selling calves/lambs early, culling all barren cows/ewes, and keeping fewer replacement heifers/ewes should be followed.

During a drought very few practices are profitable, pres-
tige becomes less important, and management is far from easy. Therefore, ranch stability is the most important objective. With this in mind, the high cost of additional forage from fertilizer and irrigation may still be less expensive than buying expensive feed or selling good quality cows or ewes at low prices.

Often during drought, it's more economical to cut hay from intensively managed pastures than to graze them. This requires more labor and machinery, but the maximum utilization of limited forage is more efficient.

**Deferring rangeland grazing**—Another advantage of supplemental pastures exists during both wet and dry years. All native rangeland vegetation has one or more critical periods of growth. If grazing is concentrated on supplemental pastures and deferred or reduced on rangeland during these periods, forage production can be greatly increased on the rangeland. Depending on the growing conditions, 30 to 45 days deferment from grazing during the critical early growth can often double rangeland production in one growing season. Overgrazing native perennial plants during 2 or 3 years of drought may require many years of light or no grazing to regain full production.

**Flush/calving/lambing**—Supplemental pastures can be used to good advantage by those ranchers who use a limited breeding season. Several forages are available which can provide high quality feed for this period. Since reproductive performance, conception, and percent calf or lamb crop are very dependent on the nutritional value of the forage just prior to breeding, high quality supplemental pastures make excellent breeding pastures.

Management is also easier when breeding and calving/lambing are done in smaller supplemental pastures rather than out in the big rangeland grazing units. Predation, rustling, and other death losses are less of a problem when calving/lambing is located where herders can check the cows/ewes more often. High quality forage produces more milk which means strong baby calves are more resistant to diseases, parasites, etc. at an earlier age, and there are fewer weak lambs to entice wandering coyotes to trail the band.

**Pre-conditioning and fattening**—If calves/lambs are kept on the ranch after weaning, high quality forage will be desirable at this time also. Growing steers/lambs need the highest quality forage of all classes of cattle/sheep if they are to produce maximum muscle and bone growth.

By using the right combination of forages, steers/lambs can be raised to slaughter weight in good condition (grass-fat) with minimal supplemental grain. Many ranchers finish their steers/lambs by feeding grain on supplemental pastures. Dry, cull cows/ewes can also be fattened on high quality forage after culling if weaning is early enough in the fall.

**Wildlife**—And for those interested in supplemental income from wildlife or just because wildlife are part of the ranch, increasing the amount and diversity of supplemental pasture greatly enhances wildlife habitat. Green pastures at the time of hunting season provide good locations to place your hunters (especially bowhunters) and are not considered 'baiting' by state fish and game departments. Waterfowl, upland game birds, and livestock grazing on grain crop aftermath are compatible and even symbiotic under certain management conditions. Deer and antelope fattened on alfalfa, sweetclover, or other pasture species during the summer taste better and have bigger racks than those fattened on sagebrush or greasewood.

**Summary**

Supplemental pastures can be a very useful range development practice if properly selected to fit ranch needs and properly managed to obtain the optimum forage potential. Supplemental pastures also provide a high degree of grazing flexibility as long as the proper balance between forage from native vegetation and forage from supplemental pastures is maintained. Supplemental pastures will not solve all problems, and mistakes can be made; but with the risk and uncertainty in ranching today, some extra forage certainly helps ease a rancher's worried mind.

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