Pastures for South Dakota

Ralph E. Johnston
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Pastures for South Dakota

South Dakota State College, Extension Service
And United States Department of Agriculture
Cooperating, A. M. Eberle, Director, Brookings.
Nearly 16 million acres of land in South Dakota are used for pasture, according to the last Federal Census. This is just a little less than one-third of the area of the state. With such a large part of our state into pasture land this subject is certainly one that deserves more attention. This is especially true during these times and with our problems of acreage reduction.

Kinds of Pastures

There are three types of pastures in South Dakota:

1. Permanent pastures of native grasses.
2. Permanent pastures of tame grasses and legumes.
3. Temporary pastures.

Only the permanent pastures will be discussed in this brief circular. This type of pasture will be explained in more detail by areas. The temporary pastures are fully discussed in a circular entitled, "Emergency Pasture Crops For Dairy Cows," by G. Heebink, Extension Dairyman, copies of which may be obtained by writing to State College, Brookings.

Why Permanent Pastures

"In the beginning," or before the white man started to farm the soils of South Dakota nearly the entire state was one vast expanse of prairie sod or a permanent pasture of native grasses. Most of the present pasture area of the state is still of this type. One of our present land problems in the central and western portions of the state is to get large areas of the land "back to grass." The nation wide program for crop reduction is forcing this change. Several years of low prices for farm products, a number of years of poor crops, drouth and grasshoppers, all contribute toward this change.

Much more could be written about this movement. This is to be a brief circular, however, so for further reasons as to "why" more acres of grass or pasture crops, the reader is referred to the circular prepared by Mr. Heebink.

**HOW TO USE THIS CIRCULAR**

This circular is divided into the following sections:

1. Pasture Areas of South Dakota and a recommended "standard" mixture of grass and legume seeds for each area. Variations from this "standard" mixture are given to meet special conditions. Pages 2 to 5.
2. Some principles to be considered in making pasture mixtures. Pages 5 and 6.
4. Grasses and legumes suitable for South Dakota. Pages 8 to 11.
This is the extreme southeastern corner of the state. It is the most favored section with respect to securing stands of permanent pastures of tame grasses and legumes. More rainfall is received in this area than any other with the exception of the higher parts of the Black Hills.

Mixture for Area I

*Bronegrass  — — — — — — — — — — — — — 7 pounds per acre.
Kentucky Bluegrass — — — — — — — — — — — 2 "  "  "
Timothy — — — — — — — — — — — — — 5 "  "  "
Medium Red Clover — — — — — — — — — — — 2 "  "  "
Alsike Clover — — — — — — — — — — — — — 1 "  "  "
White Sweet Clover — — — — — — — — — — — 3 "  "  "

TOTAL: — — — — — — — — — — — — 20 pounds per acre.

*The Bronegrass should in most cases be seeded separately because it does not pass through a seeder readily.

The above mixture is for average conditions in Area I where a permanent pasture is wanted.
This mixture may be changed to meet certain special conditions, for example:

1. On the lower and better watered lands the Bluegrass could well be increased from 50 to 100% and the Bronegrass reduced or taken out entirely. Also the White Sweet Clover could be taken out and in its place another pound of each of the Red and Alsike Clovers added and then one of White (Dutch) Clover.

2. On the higher, drier, poorer soils the simpler mixture of more Bronegrass, Sweet Clover, Timothy would be recommended. This is also the type of mixture to use when a more inexpensive one is desired.

3. On the lowlands that are inclined to be wet the mixture should consist of more Alsike Clover and less of the other Clovers, and with Red Top replacing most of the Timothy and Bronegrass.

4. If Sweet Clover is objected to it may be taken out entirely and one pound more of both the Red and Alsike Clovers added.

5. If the seeding rate of 20 pounds per acre seems a little high, it may be cut to the rate of 18 or 15 by making it cover more land. See mixture card on page 12.

**Area II.**

This large area, together with Area I, makes up approximately the eastern one-third of the state. Most of these two areas lie east of the 99th meridian which is supposed to mark the eastern boundary of the Great Plains.

Area II receives on the average from 20 to 25 inches of rainfall. It is more difficult to secure stands of tame pastures in this area than in Area I. There are still some native pastures in this area and in the main they should remain as such, receiving proper care and attention rather than to be "broken up," and tame pastures planted.

There is one big difference between Areas 2-A and 2-B that in some respects makes a sharp contrast between them. Area 2-A is in the main five hundred feet higher than Area 2-B which is the valley of the Dakota or James River except in the extreme southern part. Some of the higher hills in the northeast part of Area 2-A have an elevation of over 1800 feet while the average for the James River Valley is around 1300 feet. This makes Area 2-A somewhat more favorable for starting tame pastures than Area 2-B.

**Mixture for Area II.**

<table>
<thead>
<tr>
<th>Component</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronegrass</td>
<td>8 Pounds per acre</td>
</tr>
<tr>
<td>Timothy</td>
<td>6 &quot; &quot; &quot;</td>
</tr>
<tr>
<td>Sweet Clover</td>
<td>3 &quot; &quot; &quot;</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>3 &quot; &quot; &quot;</td>
</tr>
<tr>
<td><strong>TOTAL:</strong></td>
<td>20 &quot; &quot; &quot;</td>
</tr>
</tbody>
</table>

This mixture might be called the standard for this entire area. It is designed to be a permanent pasture mixture. The area, however, is so large with such variations that changes can and should be made in the mixture to meet special conditions.
For Area II-A and the southern third of II-B on the richer and more moist soils a mixture more like that for Area I may be better than the one suggested on page 3. Also on the lowlands that are apt to be wet the use of Alsike Clover and Red Top is recommended. Reed Canarygrass should also be considered for the wetter soils in II-A. On the higher, rougher, drier soils of this area either Slender or Crested Wheatgrass could be used in whole or in part. (See page 9 for further information about the Wheatgrasses.)

If Alfalfa is objected to, then more Sweet Clover can be used, and where Alsike Clover and Red Clover are known to be adapted they can be used to take the place of Alfalfa. If both Alfalfa and Sweet Clover are thought undesirable, then they may be cut down until only a couple pounds of each are in the mixture and more grasses added, or they may be taken out entirely. If this is done then a combination of 4 to 5 pounds of Red and Alsike Clover must be added. A more simple yet more temporary pasture mixture is to use just the Timothy, Sweet Clover and Alfalfa, using a little more Timothy than is named in the mixture.

Conditions in Area II-B are in the main more severe for securing a stand of tame pasture than in II-A. Thus the standard mixture already given applies to a greater degree in II-B than II-A. In all of II-B the wheatgrasses could well take the place of some or all of the Timothy when the seed is not too expensive. Most of the changes from the standard mixture suggested for Area II-A apply also to II-B, especially in the places that are more favorable than the average for securing a tame pasture. This area has a more "drouthy" soil than Area II-A or Area I.

Area III.

This area by reason of its lower rainfall than Area II and its greater tendency to hot winds is less favorable for tame permanent pastures.

This is the largest pasture area of the state. A large percentage of this area is still in native pasture and as such it should remain. The native grasses in the entire area are recommended above any that man can plant. The greatest single permanent pasture problem in this area is to take proper care of the native pastures. This means in different cases such practices as rotation grazing, deferred grazing and reseeding.

In most of Area III-A conditions are more favorable to securing a stand of permanent pasture plants than in III-B. In parts of III-A and along the valleys in III-B local conditions are more favorable than most of this area and in these spots it is possible to do more with permanent tame pastures.

Mixture for Area III.

<table>
<thead>
<tr>
<th>Grass</th>
<th>Pounds per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bromegrass</td>
<td>6</td>
</tr>
<tr>
<td>Wheatgrass</td>
<td>4</td>
</tr>
<tr>
<td>Sweet Clover</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
</tr>
</tbody>
</table>

If tame pastures are to be secured in this area only the hardiest kinds should be planted. Bromegrass and the Wheatgrasses are hardy, both in resisting drought and cold. The two Wheatgrasses of which there is a supply of seed are Slender and Crested. During most years the price of the Slender is not prohibitive and
it can therefore be used. Right now the supply of the Crested is limited and the price is high. This grass must therefore be used sparingly, unless one has plenty of money. The Crested Wheatgrass is recommended above Slender Wheatgrass or Bromegrass for this Area. A small amount of the Crested should be used if possible so as to get it started in the pasture. Fields of the Crested for seed production, to increase the supply of seed could well be planted. Pastures may be established by just using these grasses alone and not in a mixture.

On the lands in this area now abandoned from grain production, some effort should be made to get them "back to grass." Right now the most promising single grass for this entire area of which there is a supply of seed or of which a supply can be developed is the Crested Wheatgrass. Where one can secure seed of the Western Wheatgrass it should be used. This grass is not in commercial production so seed will have to be secured from native meadows which are allowed to produce seed.

Area IV.

This area is not much different than Area III-B, except that in general it is more nearly of one type, mainly loam turning to sandy soils in the extreme southern part. Also there is an area of "bad lands" in the northwestern part. This area is also very largely, taken as a whole, still in prairie grass. What has been said about prairie sod under Area III will apply with even greater force to this area.

Whatever is found satisfactory as a permanent tame pasture mixture for the loam and "lighter" soils of Area III-B will apply to this area.

Area V.

The major portion of this area comprises the Black Hills. The foothills, irrigated valleys and irrigated section east of Belle Fourche are also included.

In this area will be found conditions which will require all of the permanent pasture mixtures listed in this circular.

The irrigated lands will "take" just about the same mixture as Area I or one containing even a greater variety of grasses and legumes and a heavier rate of seeding per acre. The same is in large part true of the valley lands in the higher altitudes of the Black Hills.

On the higher lands or the "divide and bench" lands between the streams the same mixture and seeding methods that apply to Area III should be followed.

Making Pasture Mixtures

There are several principals back of the making of pasture mixtures which should be kept in mind by everyone who plans to plant such seed.

1. Mixtures are generally more desirable than one kind of grass or legume seeded alone because they afford variety, palatability and usually there is an increased amount of feed per acre.

2. Pasture mixtures should consist of both grasses and legumes.
3. The different kinds of seeds selected for a mixture should represent the kinds of plants best adapted to the soil, rainfall and general crop growing conditions where they are to be planted. (See pages 8 to 11 for information about the different grasses and legumes for South Dakota.)

4. From among the list of grasses that are available for a pasture mixture there should be selected, if possible, at least one grass that will form a turf or sod such as Brongegrass or Kentucky Bluegrass.

5. Each mixture should include one or more of the quicker growing grasses such as Timothy or one of the Wheatgrasses.

6. Mixtures may be for a short rotation or a long rotation. The mixtures for the short rotation pasture must be made up of the more inexpensive seeds that produce quickly such as Timothy, Sweet Clover, etc. The long rotation or more permanent mixtures must include such seeds as Bluegrass or Brongegrass, White Clover or Alfalfa.

7. When a mixture calls for Brongegrass it is best to leave this out of the mixture if it is to be planted with a machine and plant it separately because this seed does not readily pass through a seeder.

8. The cheapest seed for a pasture mixture is the best seed—that is, seed of good to high quality. It is possible for much poor grass and legume seed to be disposed of in pasture and meadow mixtures. By all means Know-What-You-Sow in this respect.

9. Mixtures may be varied considerably depending upon the price of the legume and grass seeds. Thus if one is in a section where Bluegrass should be used and the seed is reasonable or low in price, more could and should be used than when it is higher. The same holds true for the other seeds.

It is not the intent of this circular to try and make everyone who plants a pasture an expert in this rather particular task. Most folks when they need such seeds could well afford to consult a reliable seed company to find out what they have in the way of a pasture mixture. In most cases they will have some one standard mixture. Ask for the percentage of the different seeds making up this mixture. Know its purity and germination. In other words KNOW all about this mixture and if it is satisfactory for you, then you can buy it without making up one of your own.

If, however, your needs show a higher percentage of one or more kinds of seeds than the mixture contains, you can buy these separately and mix them in. Also if you have some "low spots," or some "high areas," which are in need of some special kind of seed or seeds, you can buy these separately, plant them where they should go and then leave the general mixture off these places, or at least put but a very light seeding on them.
Suggestions for Securing Pastures

Securing a "stand" of pasture grasses and legumes is a far different job than that of planting corn and the small grains. The seed of these plants is small, most of them grow slow at first and in other ways they are different than the crop plants that we are most accustomed to planting.

The Seedbed: A carefully prepared, well cultivated, well packed, moist seedbed is absolutely essential. If seedbed is meant the whole of the plowed or cultivated soil and not merely the top few inches. If this Fine-Firm-Moist seedbed cannot be prepared then in most cases it is best to leave the seed in the bag until such a condition has been brought about. (Remember that a moist seedbed means moisture in the soil for at least a foot deep and two to three feet would be better.) A loose, open, cloddy, dry seedbed is NO place for grass and legume seed. These small seeds cannot be expected to germinate, take root, and grow under such surroundings. Be sure the seedbed is firm. A land packer of some kind is usually necessary in preparing the pasture seedbed. If a manufactured packer is not available then the ordinary disk harrow properly weighted can be used. The solid surface roller may also be used but since it leaves the surface of the field smooth a light harrowing should follow its use to leave the soil a little rough.

How To Seed: If one has or can secure a drill, that is the best way to plant a pasture mixture. Thus with a fine, firm, moist seedbed, by using a drill the seed can be placed in the soil so that the results should be a maximum stand of plants. If the seed must be broadcast, either by machine or by hand, greater care must be taken to see that a uniform job is done and that the seeds are covered. These small seeds should be planted shallow, from one-half to one inch, depending upon the soil, seedbed and season. If hand seeding is done it is advisable to first plant one-half the seed, then plant the second half at right angles to the first. Thus will a more thorough job be done and with fewer skips.

In most of the state a nurse crop is not recommended. In Areas I, II-A and in parts of the southern end of Area II-B a nurse crop of one-half or less of the usual seeding rate for some small grain may be used. In other areas a nurse crop should not be used except in special cases such as in sandy soils or soils that "blow" readily, in fields that are irrigated or which receive additional moisture. In some cases to stop the soil from moving it may be advisable to drill a few rows of grain, then skip an area from three to five times the width of the "nurse crop" area and thus repeat such alternate plantings across the field.

Time to Seed: Early spring is the usual time for planting grass and legume pasture crops in South Dakota. This means about the time wheat is planted or not later than out seeding time. If, however, that fine-firm-moist seedbed is not available and it looks like a rather "poor risk" to put the seed into the ground, it is usually well to hold back and wait for favorable seeding conditions just following mid-summer when the main heat of the summer is past. This would be called late summer seeding and if the "ideal seedbed" is ready at that time, it is all right to seed then, especially if the field has been cultivated during the late spring and early summer and some extra moisture has thus been stored in the seedbed.
It is usually fatal to the small plants coming from the small grass and legume seeds to have them sprout in a seedbed that carries only a few inches of moist soil. Many of the young plants will wither and die and this is especially true if the weather turns extra warm. If, however, even though the weather turns warm, whether it be in spring or late summer, and there is sufficient moisture in the soil for the roots of the small plants, they are pretty certain of continuing their growth and producing a stand of pasture plants.

**Amount To Seed:** Suggested seeding rates per acre have been set down with the pasture mixtures named in this circular. These are only suggestions. The amount seeded can vary per acre depending upon the quality of the seed, the soil, seedbed conditions, seeding methods used and general weather conditions. The more favorable all these conditions are the less seed need be used. If, however, the seed is poor, the soil and seedbed none too good and hand broadcast methods of seeding must be used at a time when the general crop growing prospects are rather unfavorable, then more seed would have to be used.

### Grasses and Legumes Suitable For South Dakota

**Brome Grass** *(Bromus inermis)* also known as "smooth brome," commonly called just Brome. A very long-lived, cold and drought resistant grass. It forms a thick, tough sod after a few years. Stands pasturing very well. Starts growth early in the spring and continues until late in the fall. Very palatable. Starts slowly from seed but once it becomes established it is very aggressive. Prefers rich loam and clay loams but does well on somewhat sandy soils. Adapted to all parts of South Dakota.

Many folks are somewhat reluctant to buy Brome Grass seed because they are afraid of getting the seed of quack grass. This was a rather common way to spread quack grass years ago but it is now possible to secure seed free of this noxious weed. Be very careful about this point, also see that seed of cheat and soft brome or downy brome (both weeds) are not present. The seed quite often varies in price from year to year depending upon the supplies available. More seed should be produced in South Dakota. Here is an opportunity to use the acres taken out of grain crops for the production of more Brome Grass seed. For seed production the seed should be planted in rows, using from three to four pounds per acre.

**Kentucky Blue Grass** *(Poa pratensis)* quite commonly called June grass. A long lived grass resistant to cold, but not as drought resistant as Brome Grass. It forms a very close, dense sod especially on lawns, wherever it is adapted and there is sufficient rainfall. Stands pasturing well, unless greatly over-grazed during periods of dry weather. Starts growing in the spring some later than Brome Grass. Usually makes but little or no growth during July and August. Grows again with cooler weather and continues late in the fall until stopped by lack of moisture or freezing weather. A very palatable grass. Like Brome Grass it is slow to start from seed but it will crowd out other grasses and take possession of the field in those areas where it is adapted. Does its best on rich soils where there is plenty of moisture. Adapted especially to Area I and on the lower lands in Area II, especially II-A and the southern part of II-B.

The seed is usually quite expensive and of low germination. Generally only a small amount of seed per acre is planted but such an amount is a good addition to all mixtures in the areas where this grass is adapted. When the seed is cheaper, more should be used.
Wheatgrasses: There are three Wheatgrasses of economic importance to South Dakota farmers.

Crested Wheatgrass: (Agropyron Cristatum) This is a new grass but one that promises to play a most important part in getting land "back into grass" in Areas III and IV and the northern part of II-B in South Dakota. It is extremely cold and drought resistant. It does not form a sod but rather grows in bunches. Starts growth earlier in the spring than any of our other grasses. Continues to grow late into the fall but becomes dormant during the hot, dry summer. It makes an excellent pasture grass and a very palatable hay. The young plants are very tender in the seedling stage and they grow slowly at first so it is necessary that a new field be given proper care in these respects. This grass does well on a wide range of productive soils from light sand to clay.

Right now the seed is very scarce so very little is available for use in pasture mixtures or to plant alone. The immediate future seems to point toward a greatly increased demand for the seed of this grass so it is advisable that most of the seed now available be planted for seed production purposes. This is easily done because the seed quite readily flows through a grain drill. In this respect it is much easier to plant than Bronegrass. Plant from two to three pounds per acre in rows.

Slender Wheatgrass: (Agropyron tenerum) Also known as Western ryegrass. A hardy grass but not as much so as the Crested Wheatgrass or the Bronegrass. It is often more productive for the first two or three years but is usually shorter lived. It is a bunch grass like the Crested Wheatgrass. More easily established than the Crested Wheatgrass or Bronegrass and comes on more rapidly. It is adapted to all parts of South Dakota but especially areas II-B, III and IV.

This grass should be used with Bronegrass to establish pastures in all areas where it is adapted until seed of the Crested Wheatgrass is available. Slender Wheatgrass is the quick growing grass for its adapted areas, like Timothy is for its adapted areas.

Western Wheatgrass: (Agropyron smithii) This is a native grass of central and western South Dakota. It is sometimes called the (go-back grass) because if the original root stocks are not entirely killed out by the cultivation given to a piece of Western Wheatgrass sod, then when such work is stopped this grass "comes-back." Slender Wheatgrass is also a native grass, but it is also grown by man or commercially so seed is available. This is not true of Western Wheatgrass so it is but seldom that seed can be purchased.

The good qualities of Western Wheatgrass are widely and most favorably known to all central and western South Dakota farmers and ranchers who have either a "range" with this grass present, or a "hay bottom" of it. Because of the program to return cultivated acres of land back to grass and considering the value of Western Wheatgrass for this purpose it would seem advisable to try and save some of the good meadows of this grass for the production of seed. This is a little difficult because the seed so produced is quite often low in germination. Every pound of seed that can be produced is of value; however, because this grass forms a sod and thus if only a low percentage of the seeds grow a start is thus made which may in the end mean turning a piece of cultivated land "back to grass" -- Western Wheatgrass.
Timothy: (Phleum pratense) The best known and most used pasture and hay plant in all northern regions where there is ample rainfall. Its use in South Dakota is limited mainly to Areas I and II-A. During years of sufficient rainfall it can also be used in Area II-B, especially in favorable locations. It is very resistant to cold but not to drought. Starts very rapidly from seed which is usually low or very moderate in price and for these two reasons it is quite generally and generously used in pasture mixtures. It stands trampling well.

Red Top: (Agrostis Alba) This grass is recommended especially for low, wet lands where it is usually used with Alsike Clover. Strange as it may seem it is also used on rather poor, thin soils or where more desirable grasses do not do so well. As it reaches maturity it becomes rather unpalatable. Seed costs are usually very reasonable.

Reed Canarygrass (Phalaris arundinacea) A long-lived grass. Native in the wet peat or muck soils of Minnesota where it is a most valuable pasture plant. Growth begins early in the spring and continues until late fall. The price of the seed is still high, although it has been reduced materially the last few years. If it has a place in South Dakota the lowlands in Area II-A seem to be the most likely spots.

Sweet Clover: (Melilotus Alba) This is the ordinary biennial white which is so well known that it needs little attention in this circular. It is very hardy, drought resistant and stands grazing and trampling very well. It is adapted to all parts of South Dakota and is the one legume plant that can be universally used in all areas of the state.

Besides this Sweet Clover there is the common biennial yellow, then the Dwarf or Grundy County White, the Arctic and the Albotrea (yellow). The common biennial white is usually preferred to the other types because it yields more and lives through a longer pasture season and starts as early in the spring as any of the others. Seed of this kind is usually cheaper. The common biennial yellow is sometimes preferred for fields in the central and western parts of the state, either on the rougher or poorer land or where it is planned to leave the field in pasture for as long a term of years as possible.

Alfalfa: (Medicago sativa) This plant just alone makes the outstanding hog pasture for South Dakota. It is not, however, recommended alone for cattle and sheep because of the danger of bloat. Used alone Alfalfa is the premier hay crop for this state and many more acres for this purpose are now needed because of our acreage losses during recent years from drought and grasshoppers. Alfalfa is being used by increasing numbers of people as a part of their pasture mixture. This seems advisable when there is sufficient grass in the pasture and when the pasture growth is kept quite closely grazed so that there is not a rank growth of Alfalfa for the cattle or sheep to eat.

Alfalfa is too well and favorably known by South Dakota farmers to need further description in this circular. It is a perennial adapted to all parts of the state. If hardy northern grown seed is used the plants are winter hardy with proper treatment of the field.
Red Clover: (Trifolium Pratense) This is the great biennial hay and pasture legume of the northern United States where moisture is sufficient. In South Dakota Red Clover is adapted in Area I and on the more favorable sections in Area II-A. Even in these areas, Sweet Clover can be expected to do better than the Red Clover except during the most favorable seasons. It starts rapidly from seed and tends to resod itself when not too closely pastured.

Alskike Clover: (Trifolium hybridum) Also known as Swedish Clover. This clover lives more than two years, usually from five to six and is thus known as a short lived perennial. It is not so particular to soil conditions as Red Clover. It could well quite largely take the place of Red Clover in pasture mixtures for Areas I and II-A. The seed is small, there being about three times as many seeds per pound as in Red Clover.

White Clover: (Trifolium repens) Known more commonly as Dutch Clover. It is the Clover that we have in Bluegrass lawns. A long-lived perennial. It has the spreading habit, sending out creeping stems which take root frequently, thus helping to spread the plants over the field. It stands grazing and tramping very well. It is adapted only where there is plenty of rainfall or where the soil is usually moist. It is not recommended in pasture mixtures for South Dakota except where they are to be planted in the lower lands in Area I and to a lesser extent in II-A. Whenever used it is necessary to add but a small amount of seed. The seed is generally quite high in price.

Handling Our Present Pastures

Pastures require management the same as other fields. Too often, however, with their use they must stand lots of abuse. If with their use and abuse there is coupled several years of unfavorable weather conditions, the plants become weak, the weeds come in and there is less and less pasturage.

This condition should be avoided if possible. To try and "bring back" such pastures it is necessary to:

1. Allow the plants to make considerable growth in the spring before any livestock is turned into the pasture.

2. Graze such pastures lightly for a season or two making use of temporary pastures such as fall rye, Sweet Clover, Sudan Grass.

3. Try and do some re-seeding by early spring disking, drilling or broadcasting the seed, then harrowing. See that the seed is covered. Keep the livestock off until the young plants have become estabished and then follow point #2.

4. Mow the pasture once or twice to cut down all weeds. Do this when it will do the most good. This is usually when the flower buds appear or when the flowers are first out. Never wait until after seed has formed.

Overgrazed native pastures especially in the central and western parts of the state can be greatly benefitted by following the system of deferred and rotation grazing. This means that while one pasture is not used in the early spring, the grazing being deferred, that some other one is used; then when the livestock is turned back into the deferred pasture, the one first grazed is rested and thus the rotation made complete.
**PASTURE MIXTURE CARD**

*To Be Used In Making Up A Pasture Mixture.*

<table>
<thead>
<tr>
<th>Legal Description of Farm</th>
<th>No. of Acres</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Location of Field</th>
<th>Acres</th>
</tr>
</thead>
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### THE FIELD:
- Upland
- Lowland
- Wet

- Level
- Rolling
- Rough
- Stones

### THE SOIL:
- Loam
- Clay
- Sandy

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**Suggested Mixtures**

<table>
<thead>
<tr>
<th>For:</th>
<th>For:</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Lbs.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL lbs. per Acre</td>
<td>TOTAL lbs. per Acre</td>
</tr>
</tbody>
</table>

**NOTES:**

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