MINNESOTA FEEDSERVICE

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Tomorrow's Herbicides TODAY!

WILLIAM F. HUEG, JR.*

During the last decade tremendous progress has been made in controlling weeds by the use of herbicides. The original 2,4-D is still actively used, but it was apparent early in its use that many weeds were resistant to its potent powers. New chemicals have been constantly added to the battle on weeds. Some of the newer herbicides are discussed here.

The Butyrics

"The butyrics," 2,4-D butyric acid (2,4DB) and MCP butryric acid (MCPB), differ from 2,4-D and MCPA both chemically and in their selective action. The butyrics are harmless to plants until converted to acetic acid. This conversion takes place within the plant tissue after the chemical has been absorbed. The efficiency of this process varies among plants. If the activity of the herbicide is greater on a weed than on a crop, it is possible to kill the weed with an application that does not injure the crop.

The crops that are resistant to injury are small grains, corn, alfalfa, red clover, birdsfoot trefoil, peas, potatoes, and some horticultural crops. Weeds such as shepherd's purse, lambsquarters, Canada thistle, buttercup, curled dock, common mustard, white cockle, plantain, pennycress, cocklebur, dragonhead mint, red root pigweed, velvet leaf, and wild vetch can be controlled in these crops.

At present the butyrics have not been cleared for use by the Food and Drug Administration, but approval is pending.

Simazin

Another new herbicide is "Simazin." This chemical is effective against annual broad-leaved and grass weeds. Simazin is not soluble in water and so is formulated as a wettable powder that will remain in suspension if adequately agitated. Because of its insolubility in water it remains in the upper soil level for considerable time. It is not known at present if it lasts more than one season in Minnesota soils.

Simazin may be used for complete vegetation control around grain storage areas, elevators, and fence rows. It is noncorrosive and easily removed from spray equipment.

Crops that are resistant to injury from simazin are corn, tomatoes, asparagus, and potatoes. Simazin has been cleared for selective use by the Food and Drug Administration on field corn, sweet corn, and seed corn of both crops. The recommended rate of application is 3 pounds per acre of active ingredient. This is best applied in a 12- to 14-inch band over the row to reduce the cost of material either as a pre-emergence application or just when the "spike" emerges.

Amino Triazole

Amino triazole has not been cleared for use on food crops by the Food and Drug Administration. However, information on residues is being furnished and clearance is pending. Its selective use in farm crops is limited to preplanting applicaitons and lay-by treatment of corn. It shows distinct advantage over other soil sterilants in that it is readily leached so that the soil is not left unproductive for long periods. Also its cost per given area may be less than other materials because of low rate of application.

Amino triazole can be applied one to two weeks before planting soybeans or corn without injury to the crop. This is important for early spring applications on quackgrass and thistles. Lay-by applications in corn by the use of drop nozzles has been successful.

Some of the weeds that are susceptible to amino triazole are: leafy spurge, milkweed, quackgrass, Canada thistle, perennial sow thistle, cattails, poison ivy, ash, and scrub oak.

Randox

Randox (CDAA) is a selective herbicide that controls annual grass weeds. It is not generally effective on broad-leaved weeds. Both laboratory and field studies in Minnesota indicate that Randox is least effective at cool temperatures. It is cleared for use on corn, soybeans, sorghum, beans, onions, and peas.

The chemical is noncorrosive but is very irritating and can be absorbed through the skin. Extreme care should be used when handling and spraying.

Randox has been most successful as a pre-emergence application on corn and soybeans. Band applications reduce the cost.

Randox-T is a new formulation that will be tested in Minnesota for the first time in 1958. This herbicide is effective against both annual grass weeds and broad-leaved weeds. It has not been cleared for use on any crops other than for experimental use.

Dalapon on Flax

Dalapon is not a new herbicide but its use on flax is a new recommendation. The Food and Drug Administration has cleared dalapon for this use.

It can be sprayed post emergence for control of annual grasses at 1 pound per acre. Dalapon is less injurious to small seeded legumes undersown with flax and is cheaper than TCA which has been used for grass control. Dalapon can be mixed with MCPA, 2,4-D, or 2,4-DB. A mixture of 1 pound of dalapon and ½ pound of 2,4-DB has been the best spray for flax undersown with a legume.

Further information about these and other herbicides is given in Extension Folder 191 "Cultural and Chemical Weed Control in Minnesota" which can be obtained from your county Extension Office or from the Bulletin Room, Institute of Agriculture, University of Minnesota, St. Paul 1, Minnesota.

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Productive Pastures

WILLIAM F. HUEG, JR. and WALTER F. WEDIN*

The grasslands of Minnesota are often neglected so that many acres in pasture crops return only a fraction of their potential production. Forage crops are a source of important feed nutrients and when porperly managed are the cheapest source of home-grown feed.

A fundamental characteristic of productive pastures is the proper combination of soil and plant species. Too often the crop is not adapted to the particular soil because of poor drainage, droughtiness, acidity or alkalinity. When the climate is also unfavorable for the selected species, it is difficult to have productive pasture.

Production Factors

Proper combinations of legumes and grasses usually give the best results as pasture crops. It is important, however, to select species that are compatible with one another. Research along with observation, has shown that the "shotgun" or complex mixture is outdated. A simple mixture may be made up of from one to three species.

A complex mixture is more than three species but often contains five to seven species. Very often one or two species are most competitive and best adapted to a given situation. These are the species that produce the pasture stand. Combinations made up of several grasses and legumes are costly because of the generally large seeding rate. They often include too small amounts of any one specie to be effective.

In order to insure good seeding establishment, fields to be developed for pasture should be soil-tested. The fertilizer and lime should be applied according to the soil test recommendations.

If a companion crop is used, sow at 1½ to 2 bushels per acre and harvest this as silage in the early dough stage or graze when 12 to 14 inches tall. When the grain is allowed to go to maturity, the stand may be somewhat reduced.

Use a culti-packer seeder or a band-seeding attachment on a regular grain drill should be used wherever possible to keep the small-seeded grasses and legumes near the surface where they have a better chance to germinate.

When a pasture is ready to be grazed, there should be sufficient growth to provide adequate feed. Use a sufficient number of livestock in a given area to graze the pasture completely in a short period of time.

Grazing Systems

Research has shown a decided advantage for rotational over continuous grazing of pastures. This is important both for sustained production of animals and pasture and also maintenance of the pasture stand. The level of rotational grazing that will be used on an individual farm will depend on how much management the operator wants to employ.

Daily rotational grazing or "ration-a-day" will require the greatest degree of management in a grazing system, but has given best results. However, weekly or bi-monthly rotation will still provide more production per acre over continuous grazing.

"Zero grazing" or green-chopping is another system of pasture management. In this system, chopped forage is brought to the livestock in a feed lot which involves extra cost. All of these systems can be adapted to a given situation and the best method can be determined after careful study.

Alfalfa-grass mixtures are usually ready to graze when 8 to 10 inches tall. It is important that forage beginning to blossom or head be removed as hay or silage since it becomes less palatable to grazing livestock and much waste results. Depending on the species, straight grass pastures can be grazed when they are 4 to 8 inches in height. Again, they should be harvested when they begin to head.

A more important factor than palatability is the major reason for cutting forage that begins to head. The development of flower heads on grasses slows down the vegetative process. If grasses are cut very long after heading, the period for recovery growth may be prolonged 3 to 5 weeks than if the grasses had been cut just at heading or before. This is an important factor if most of the season's grazing is to be obtained from permanent type grasses.

Number of Livestock

The number of livestock available for grazing may be a critical factor for fully and economically utilizing pasture. Turning a small number of animals into a large pasture area results in much loss of valuable forage due to trampling, selective grazing, and advanced maturing before grazing. Also, the nutritive level of these pastures are more variable over a given period than where the pasture is grazed quickly at the proper stage of development.

Early in the season, pastures can usually support two to four animal units per acre because of the large volume of forage. Through the summer, depending upon the fertility level, rainfall and management practices employed, fewer livestock per acre may be the rule. To insure continued pasture supply either more acres must be used for pasture or supplemental pasture be provided.

Supplemental Pastures

When supplemental pastures are a part of the summer feeding program, they should be planned for high production. Using average requirements, it is possible to figure the time of planting to insure adequate production when needed. The crop should be fertilized to insure quick establishment and rapid growth.

Sudangrass is one of the common

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Feeding Cattle

BEEF CATTLE

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Pastures play an important part in beef production. Farmers with breeding herds depend on pasture to maintain their cows, calves, and replacement heifers during the summer or fall. Many feeders who are fattening cattle feed grain on pasture. In either case the main idea is to reduce feed and labor costs. Whatever use of pastures is made, don't turn animals into pastures too early. With most grasses this is 5 to 8 inches high and with alfalfa 8 to 10 inches high. A good time to turn them on is just before heading or bloom.

There are many different methods of utilizing pastures. Each has merit for certain conditions.

Cow and Calf Herd

A plan which works very well for cow and calf herd areas like southern Minnesota follows:

First, feed the cows during the winter so that they will gain 150-200 pounds.

Second, graze them on legume-grass pastures from about May 15 until about October 1.

One area of Sudangrass as a supplement may prove a valuable asset during dry months.

Steer and Heifer Fattening

In a steer or heifer fattening program the following general plan works very well:

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Pasture Management and Summer and Sheep

crops used for this purpose. It requires about 7 to 8 weeks from the time of planting before it is ready to graze. Growth should be about 18 inches when grazed the first time. However, the new Piper Sudangrass has a lower prussic acid content and it may be possible to graze at a shorter height. A minimum of four animal units per acre should be the carrying rate.

Rotation and permanent pasture lands in Minnesota are a valuable resource. Good management practices will make possible efficient utilization and more efficient production per pound of milk, beef, wool, or lamb during the summer feeding period.

First, winter cattle so that calves will gain 1-1.3 pounds and yearlings 1.3-1.6 pounds per head per day.

Second, turn them onto pasture about May 15 depending on how far pasture has developed. Then follow either one of these plans:

1. Graze cattle during summer on pasture with **no grain feeding** and then put in drylot in fall (time depends upon pasture growth). A good rotational pasture will give gains of about 1.7 pounds per head. On the average an acre of good pasture will produce 250 pounds of beef. Finally, full feed grain until cattle reach the desired marketing grade.

2. Turn them onto pasture about May 15, allowing them to graze on grass alone for about 30 days. Then start to feed grain on pasture and gradually increase the grain as pasture becomes less productive. Finally, in August either increase grain to full feed on pasture or put cattle in drylot for finishing. In either case the cattle should be full fed and marketed in the fall.

DAIRY CATTLE

J. D. DONKER*

Pastures are the most economical source of feed nutrients for dairy cattle for approximately five months of the year. The quality of the pasture determines to what extent the ration needs supplementation to provide an adequate intake and balance of nutrients for satisfactory performance.

High quality pasture is characterized by an abundance of protein, vitamins, and minerals which the animals need. The energy in young pasture forage is highly digestible and very readily available contrasted to the low availability of energy in mature grass and legume plant materials.

Pasture forage for dairy animals can be managed in several different ways. In times past, almost all animals were merely turned into "the pasture" in the spring and removed in the fall. In recent years, considerable effort has been made to increase forage yields on land devoted to summer feeding of livestock. This can be accomplished in several ways.

The use of superior varieties and mixtures of species, proper fertilization, irrigation, and management practices can all improve carrying capacity of pastures.

Rotational Grazing

Rotational grazing in one of several forms is one management practice which increases carrying capacities of most pastures by 25 percent or more.

Rotational grazing can vary greatly in the intensity of its application. Cattle can be moved through a series of pastures at rates ranging from several plots per day to two or three each month. The practice of moving cattle several times a day has been used to help overcome bloat problems on legume pastures. With pastures that do not produce bloat there appears to be no reason to change pastures more often than every 3 to 5 days under most circumstances.

To prove most beneficial, rotational grazing must be accompanied by a scheme which will save the excess forage from periods of flush growth in a highly nutritive state. Where all pastures are adequately supplemented, the productivity of the cattle will not be greatly influenced by the kind of grazing done. The saving is in land needed or in production of feed from land used. Additional carrying capacity can be gained by use of high-yielding crops and lot feeding the cattle.

Lot Feeding

The material for lot feeding can be supplied in the form of green chopped material, hay, or silage or a combination of these. These methods of feeding require considerable capital for machinery and other facilities and have rather heavy labor requirements.

There are advantages to lot feeding other than increasing carrying capacities of the farm. Less fence is required, and it is easier to provide shade and water and protection against insects. The animals can be under constant observation with much less effort.

There are disadvantages besides extra costs and effort. Cattle can become very filthy, and flies on the premises can become serious problems. Manure should be removed and distributed. Lot feeding also can seriously interfere with other work by tying up machinery.

Type of Forage

The form of the forage offered to cattle is not important nutritionally. The quality of the forage, whatever its form, is most important. Included in the quality factor is the acceptability by the livestock. While it is not common place, the rates of consumption by cattle of high quality forages have been reported in excess of 4 pounds of dry matter per hundred pounds weight daily. We should provide high-quality forage and breed the cattle which consume forage at high rates to produce milk most economically.

In our experiences at the University's Experiment Station at Rosemount, we have not been able to show an effect upon production when comparing conventional pasturing to daily rotational grazing, daily rotation to soilage, or soilage to silage.

In most of these, the major source of forage, as indicated in the comparison, was supplemented by a secondary forage (hay). It is especially important to supplement pasture with a secondary forage because many people do not have the ability or do not take the time to judge the adequacy of pasture in terms of quality and quantity.

It is not necessary to feed large quantities of grain with high quality roughage to obtain satisfactory production. However, under the present economic structure of prices for milk, grain, forage, labor, etc., it appears to be sound economic practice to supply some concentrates throughout the year.

Bloat

Bloat can be a serious summer feeding problem at times. Be sure that cattle do not go into a pasture that is predominantly legume without having had a fill of hay. Use of a penicillin-salt mixture looks to be hopeful in overcoming some of the difficulties with bloat.

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Feeding

SHEEP and LAMBS

R. M. JORDAN*

Sheep excel in the utilization of pasture crops. This is due primarily to (1) their liking for a wide variety of weeds, forages, and grasses, and (2) their ability to graze areas inaccessible to cattle. Unfortunately, these two traits have been their undoing in many cases. But there is a time and place to use sheep as scavengers. Scavenging for mere existance on weeds and dead dry grass is one thing, but expecting top production under such a plan is another. Since we are primarily interested in top production, let's consider some of the attributes of a forage crop that would make a good sheep pasture.

Generally speaking, a forage species or plant that grows rapidly (and therefore has high carrying capacity) and is palatable makes for a good sheep pasture. Carrying capacity and palatability include such factors as nutrient content, earliness, ability to stand trampling, rapid comeback following grazing, ability to stand frost, and drouth resistance. Remember that no one species of forage crop will make a good sheep pasture during the entire growing season. Nature simply didn't give one species all of the virtues. Rather it spreads the traits essential to good pasture among many species.

However, improved management of your sheep pasture can lessen this problem. For example, we might divide the pasture into four lots and rotate the sheep from one lot to another, normally about every 2 to 3 weeks. This would mean that the sheep would be eating forage when it is most palatable and nutritious. Such a system would normally allow you to take a cutting of hay off about one-half of the entire area. Pasture rotation does much to reduce the parasite problem and assure an intake of more nutritious feed. The end result is usually evidenced in heavier and fatter lambs.

Pastures and Lambs

Another important point to consider in evaluating a pasture crop is at what period of the growing season (early spring or midsummer) there will be the greatest need for abundant production. This will be almost wholly determined by the season in which the lambs are born and how they are managed.

For example, the sheepman who has his lambs come in early January—and provides the lambs with a good creep ration from about 2 weeks of age until he sells them—will find that bluegrass or bromegrass are almost ideally suited for his specific conditions. Why? Lambs born in January should be fat and weigh 90-100 pounds by July 1. They, therefore, are utilizing bluegrass during the stage of its growth when it is most nutritious and palatable and has its greatest carrying capacity. After the lambs are sold such a pasture will provide adequate feed for the dry ewes.

Conversely, the sheepman who has his lambs come in March or April will not be ready to market the lambs until late August and September. Therefore, a forage crop or a mixture of several forage crops must be provided that will furnish ample palatable feed throughout the hot summer months. Bluegrass is about the poorest under such circumstances.

Summing Up

A mixture of alfalfa and bromegrass is satisfactory as a pasture crop for the entire growing season. Bromegrass is an early season grass, it is palatable, and it will minimize the bloat problem. On the other hand, the alfalfa in the mixture will provide ample palatable feed during the hot summer months. While alfalfa-brome is vastly preferred to straight brome or bluegrass, the use of temporary pastures such as sudan grass or rape to supplement the alfalfa-brome will make for greater production per acre.

Here are two salient facts to remember:

1. Productive land managed in such a way as to result in low forage production is extravagant use of land.

2. As the lamb grows so grows his nutrient requirements. Conversely, the ewe's milk supply decreases and, therefore, her feed needs decrease materially. So, under conditions common to most Minnesota farms and to most seasons,

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Economic Aspects

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Most farming methods and practices have changed greatly in the last decade. The management of pastures on most farms, however, is the same as it was a century ago. Nearly half the feed value in pastures is lost with conventional grazing methods!

Few farmers would accept a loss of 50 percent in their corn production or other grain without protest. Yet in forage production as pastures they accept this without much thought. Perhaps they do not put a true feed value on pasture or are unfamiliar with new methods of improved pasture management such as ration-a-day grazing, rotational grazing, or green chopping that prevent such heavy losses.

What is the feed value of pastures? Although there are differences between grass species, the composition of most grasses before heading is approximately 20 percent digestible protein and 65 percent total digestible nutrients on a dry matter basis. As a comparison, oats has approximately a 10 percent digestible protein and a 70 percent total digestible nutrient level.

In other words, if grasses can be harvested or grazed without loss of their natural feed value, pasture alone should give as good feeding results as a heavy grain ration for cows producing about 45 pounds of milk per day.

With the conventional large field grazing method, cattle eat the top parts of the plants first. The upper part has a considerably higher feed value than the lower parts. In the partially eaten plants, the fiber content increases and the feed value decreases very rapidly.

According to actual field test, the protein level of alfalfa-brome pastures dropped from 22 percent to 11 percent after 3 weeks grazing with the conventional one-pasture system. Confining animals to a rather small area forces them to clean up the field before this deterioration process takes place. Of course, the same effect is obtained with green chopping.

Complete removal of the plants also induces a rejuvenation process and consequently a higher production of forage,

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Emergency and Late Planted Crops

RODNEY A. BRIGGS*

Flood, frost, hail, and drouth each year cause many Minnesota farmers to change well-made cropping plans. They based their original selection of the crops on many considerations, some conscious and some unconscious. Some of these include rotation, crop adaptability, machinery required, livestock needs, and expected market price.

When plans have to be changed due to climate or failure to make the original seeding, four courses of action are open to most farmers:

1. Utilize the crops left by using alternate harvesting methods, such as harvesting oats or soybeans for silage.
2. Replant, if possible, with the original crops.
3. Replant a short season emergency crop.
4. Leave the land as is.

In most instances two or possibly all of these will be used, depending on the circumstances.

USE GOOD PRACTICES

When replanting the old crop or seeding an emergency crop, select good seed and prepare the seedbed in the normal manner. There is little reason for replanting or seeding when moisture is inadequate for germination and growth or when there is too much moisture for good seedbed preparation.

Planting rates and fertilizer application of late-planted crops should be adjusted to fit the fertility level and the moisture supply of the soil.

One of the best methods of insuring quality livestock feed is to select an alternate method of harvesting crops. Most crops can be harvested as silage where pasture and hay seeding have failed. All the small grains, corn, or soybeans can be harvested as silage, or the small grains and soybeans can be harvested as hay. These crops, when hit by hail, can be used to fill a silo.

The only precaution is to use a preservative when the heads or pods are not filled.

LATE PLANTED CROPS

The following crops may give satisfactory results when planted late if conditions are favorable for early germination and growth. At best, however, late-planted crops are second to original planting plans. But by the use of emergency crops or replanting, much of the loss can be recouped.

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Corn

Corn will normally give good yields of forage when planted late at fairly heavy seeding rates. Use short season hybrids and return or hold over seed already purchased. Good grain yields from late-planted corn are not to be expected. Sorghum or Sudan and soybeans usually give a higher yield of forage than corn when late seeded. However, some farmers will want to use corn because of seed availability and the chance of some grain.

Soybeans

Soybeans offer a good possibility for late planting and still making a crop. For replanting, use early-maturing varieties such as Acme, Norchief, Flambeau, and Grant, before July 15 in the southern and south central soybean zones. For hay or silage any variety available may be planted up to July 15 if moisture conditions are favorable. They may be seeded in rows or broadcast. Soybeans make excellent hay when cured well, but curing is difficult because of the large stems. Use recommended preservatives when making soybean silage.

Sudangrass

This quick-growing annual grass is especially high in nutrients and has high value when used as a supplemental or emergency crop. When conditions are favorable, high yields can be expected when seeded as late as August 1. Seed broadcast or drill solid at a rate of 25 to 30 pounds per acre on a well-prepared seedbed.

Use the Piper variety as it is low in prussic acid content and is good yielding. Sudangrass may be used for pasture or silage. When used for pasture, allow it to make a growth of 18 inches before grazing. Harvest for silage when at least 10 percent of the heads are out, but you may harvest it when it is in the early dough stage.

A combination of Sudangrass and soybeans seeded together makes excellent silage. Seeded together (soybeans 30 to 60 pounds, Sudan 10 to 15 pounds per acre), they solve the weed and erosion problems caused by row-seeding soybeans and provide a higher quality forage than Sudangrass alone. Late seedings may be best if soybeans are seeded 7 to 10 days before the Sudangrass.

Sorghum

Sorghum offers an opportunity to get a large yield of very palatable, nutritious forage. Use varieties such as Waconia, Rox orange, or Black Amber. Seed in rows, 8 to 12 pounds per acre. Harvest, if possible, before frost or when heads are fully out and the top seeds have reached dough stage. As all sorghums are high in prussic acid never pasture them.

Millet

For central and north central Minnesota, the millets offer possibilities for emergency use. Available seed of common, Hungarian, or Siberian millet may be used. Sow 25 to 35 pounds of seed per acre. Most will produce seed if sown before July 1. In northern Minnesota, millet harvested early gives high yields of fair quality silage.

Rape

For hog or sheep pasture rape grows rapidly and continues growth very late in the season. Highest yields are obtained when allowed at least 10 inches of growth before grazing is begun.

Buckwheat

Buckwheat is always considered one of the best emergency crops for grain

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Emergency and late planting possibilities

Crop	Use	Latest date	Rate (lbs. per acre)
Corn	Silage	July 1	10-18 (drilled)
Soybeans	Seed, hay, or silage	July 1	60
		July 15	90-100 (solid drilled)
Sudangrass	Pasture, silage or hay	Aug. 1	25-30
Sudangrass and soybeans	Hay or silage	Aug. 1	30-60 soybeans 10-15 Sudangrass
Sorghum	Silage or fodder	Aug. 1	8-12
Millet	Silage or fodder	Aug. 1	25-35
Rape	Pasture	Aug. 1	5-7
Buckwheat	Seed	July 1	50
Winter rye	Pasture	After Aug. 1	120
Alfalfa-brome	Pasture, silage, or hay	Before Aug. 15	8 alfalfa 6 brome
Weed control		All summer	Chemical Cultural
Green manure	All crops	Fall plow	

EMERGENCY CROPS

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production or plowed down for green manure. It is usually seeded in June for best results. Yields vary greatly, but 10 to 15 bushels of grain per acre is not unusual. There is but a limited demand for buckwheat grain. The Japanese variety is best suited to Minnesota.

Winter Rye

When it's too late to seed anything else, winter rye may be seeded for fall pasture or for spring pasture or grain in the following year. If seeded before August 1, however, rust can be extremely harmful.

OTHER POSSIBILITIES

Summer seeding of alfalfa and grasses without a companion crop before August 15 have been very successful in Minnesota. This is a possibility that should not be overlooked as it offers an excellent chance to establish needed pasture and hay land.

On land where weeds are a problem many times seeding failures are a blessing in disguise. This makes a natural opportunity to control weeds by chemical and cultural methods without interference of a crop. This is the best time to attempt to control some of the tenacious perennial weeds such as Canadian thistle and quackgrass.

Sudangrass, sorghum, soybeans, corn, and buckwheat could be seeded throughout the summer for fall plow down, for the express purpose of adding organic matter.

ECONOMIC ASPECTS

(Continued from page 4)

if fertility levels of the land are taken care of.

With our superior grasses and legumes and small harvesting cost, pastures can and should provide the lowest cost feed for livestock. Table 1 shows the cost to be charged to livestock per 100 pounds of TDN based on market prices for various types of feed. In this table pasture is charged with a production cost that assumes 80 percent utilization.

Table 1. Comparative value per 100 pounds TDN of various feeds*

Type of Feed	Value per 100 pounds TDN
Alfalfa-brome pastures (2½ ton hay equivalent yield)	$ .75
Alfalfa-brome hay (2½ ton yield) or silage (7½ ton yield)	1.50
Oat silage (40 bushel yield)	2.08
Corn silage (60 bushel corn yield)	2.23
Corn grain (at $1.10/bu.)	2.68
Oats grain (at 60c/bu.)	2.68
16% supplement (at $3.00cwt.)	4.00

* It is obvious that any time a farmer neglects getting the best utilization of the pasture period, he has to supplement with a higher-cost feed. Consequently his income potential is lowered.

Table 2 shows the increased cost per cow under poor management. Here we assume that 40 percent of the potential feed value of the pasture is lost and that the cow is given supplemental feed to offset any drop in production or condition.

Table 2. Increased cost per cow with poor pasture management over 5-month period

Supplemental feed	Increased cost per cow
Alfalfa-brome hay or silage*	$ 9.37
Oat silage	16.60
Corn silage	18.47
Corn	24.09
Oats	24.09
16% protein concentrate	40.56

* A cow utilizes, conservatively, 160 pounds of pasture per day when the pasture is of good quality. In 150 days she will eat 3125 pounds of TDN. A 40 percent loss amounts to 1250 pounds of TDN. Replacing this with hay will add 12.50 × $.75 (cost per cwt.) = $9.37.

Usually the loss of feed value in pastures cannot be replaced fully by feeding of hay or silage. Ordinarily a combination of hay or silage and grain is necessary. If we assume that an equal amount of nutrients is supplied by hay and 16 percent protein concentrate, the increased cost would amount to $25 per cow. With a 20-cow dairy herd, this amounts to $500 per year. In many cases, production is lost so that the actual loss in income may be greater.

If no extra supplemental feed is given but "merely" a larger acreage used, a 20-cow dairy herd will need approximately 8 acres less pasture land by switching from conventional grazing to ration-a-day grazing. If this land were used for corn production, it could produce 500 bushels of corn with a value of approximately $550.

If the land could not be used for corn, the 8 acres saved might supply the forage feed for two or three extra dairy cows, which in turn would add considerably to the income of the farm.

Similar considerations hold true for most other types of livestock.

In recent years considerable emphasis has been given to green chopping and yard feeding, so called "soilage" for dairy cattle. Soilage is generally more costly than ration-a-day grazing, while little extra benefit is gained with perennial species.

Assuming that it takes one half an hour daily to get a 2-ton load of legume-grass mixture for 25 cows and charging labor at $1.00 per hour, the cost per 100 pounds TDN will run approximately $1.20 for soilage as compared to $.75 for pasture. The extra cost in machinery, gasoline, and labor amounts to approximately $11 extra per cow for the pasture season, or $275 extra for a 25-cow herd.

When the fields to be pastured are inconveniently located from the barn or water supply, this extra cost may be fully justified. However, careful planning of field layout in most cases can provide pasture in such a location that the cows can easily reach it. Green chopping has still a definite advantage over continuous grazing when approximately 40 percent of the feed value is lost.

SHEEP AND LAMBS

(Continued from page 4)

weaning lambs at 3½ to 4 months and providing them with excellent pasture and grain, while ewes are shifted to poor pasture or the job of cleaning up the farmstead, will result in the greatest production per acre of pasture and the greatest returns from the sheep enterprise.

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