

Improve Permanent Pastures with Lespedeza, Phosphate, Lime, and Supplementary Grazing

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Late fall pasture provided by winter barley or rye.

The acre yield of meat, milk, or wool obtained from permanent pastures can be materially and profitably increased (1) by increasing the quantity and improving the quality of the forage produced, and (2) by managing grazing so that the available forage will be fully consumed during seasons when it is more nutritious. The productivity

of the pasture can be increased, and the quality of the forage improved by applying phosphate and lime to soils that are deficient in these minerals, and by establishing a legume in the grass sod. In order to use with maximum efficiency forage produced by the permanent pasture, supplementary pastures must be provided and used during much of the summer and fall.

LEGUMES, PHOSPHATE, LIME

The key to the successful improvement of permanent pastures is the establishment in them of one or more legumes capable of growing in association with grass, partly because of the forage value of the legume, and partly because of its ability to fix nitrogen from the atmosphere and make it available to the grass.

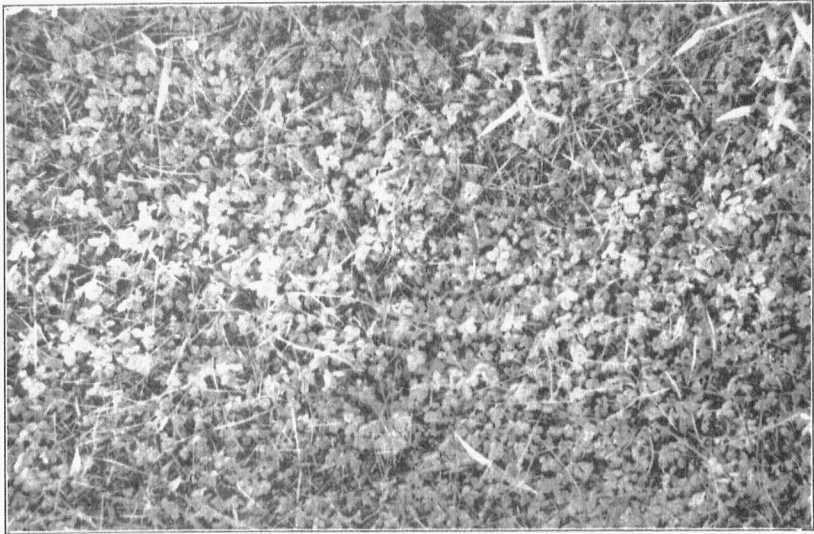
Most permanent pasture soils in Missouri are deficient, not only in available nitrogen, but also in phosphorus and calcium. These deficiencies can be corrected only by applying to the soil liberal quantities of phosphate fertilizer and agricultural limestone. Unless these materials are first applied to depleted soils, no legume will be fully effective in fixing atmospheric nitrogen and making it available to the grass. Without a legume, any improvement in the grass that might result from applying phosphate fertilizer and lime will be unprofitably small. The combined action of an adapted legume plus phosphate fertilizer and lime is required to achieve the desired improvement in permanent pastures.

USE LESPEDEZA

A number of legumes, including sweet clover, Ladino clover, alfalfa, red clover, alsike, birdsfoot trefoil, and low hop clover, have been used in permanent pastures in the Middle West with varying degrees of success. White clover invades permanent pastures without seeding when rainfall is adequate and well distributed, but its occurrence in important quantities is too infrequent and uncertain to be relied on in Missouri. The annual lespedezas, Korean and improved strains of common, have certain advantages that make them particularly useful for pasture improvement.

Either Korean or common lespedeza can be established in grass sods with a greater probability of success than any other legume yet tried in this State. In fact, if grazing is correctly managed, failures to obtain good stands of lespedeza in grass seldom occur except when rain is so abundant that white clover is plentiful or when rain is so deficient that no seedling legume could survive. Under the first condition, white clover serves the purpose quite as well as lespedeza would have, and only the lespedeza seed is lost. When drought is severe

enough to destroy lespedeza, seedlings of other legumes will not survive in grass sods.



Korean lespedeza in bluegrass sod.

Full use can be made of the pasture in which lespedeza has been sown during the first as well as during each subsequent year following seeding. In fact, the grazing schedule that makes most efficient use of Kentucky bluegrass, bromegrass, orchard grass and redtop, is also most conducive to successful maintenance of lespedeza in grass sods. This is not true of sweet clover and some other legumes which must be protected from grazing during much of the first year following their initial establishment.

The establishment of lespedeza in grass sods is relatively easy and inexpensive. No preparatory tillage of the sod is required and the seed can be broadcast or drilled along with phosphate fertilizer at any time during the winter months. Korean lespedeza seed is readily obtainable and inexpensive, but seed of Kobe and other improved strains of common lespedeza is at present difficult to obtain and is higher in price than Korean lespedeza.

The ability of lespedeza to tolerate soil acidity makes it unnecessary to delay seeding this legume until recently applied lime has had time to react with the soil. Its acid tolerance does not, however, justify withholding the application of limestone to calcium deficient pasture soils.

SOIL TREATMENT

Agricultural limestone should be broadcast at the rate of 2 to 3 tons per acre, depending on the degree of soil acidity.* This can be done at any time the weather and other farm work will permit. Lime need not be applied more often than once every 10 to 12 years.

Apply phosphate fertilizers during the cool weather of late fall or early winter. Less of the phosphate is rendered unavailable by soil fixation at low than at high soil temperatures.

Apply phosphate fertilizer to permanent pastures at the rate of not less than 500 pounds per acre of 20 per cent superphosphate or equivalent amounts of other grades. If the amount of phosphate fertilizer must be limited, apply it at the recommended rate to a reduced acreage rather than to the entire pasture at a reduced rate. Light applications of phosphate fertilizers often have no appreciable effect on old grass sods, but adequate applications continue to improve the grass for at least 5 years.

Surface applied phosphate fertilizers penetrate the soil very slowly. It is essential, therefore, that the phosphate fertilizer be worked into the soil. This is done most economically by drilling it through the fertilizer attachment of a grain drill set for maximum depth. If drilling is not possible, the fertilizer can be worked into the soil by disking or field cultivating the sod both before and after broadcasting the phosphate. Surplus vegetation should be removed by close grazing or mowing and raking before attempting to drill or work phosphate fertilizer into the soil.

SOWING LESPEDEZA IN PERMANENT PASTURES

Kobe and other improved strains of common lespedeza are somewhat better able to compete with perennial grasses and much better able to compete with white clover than Korean lespedeza. If seed can be obtained, there is an advantage in using these improved strains of common lespedeza in the southern half of Missouri where the frost-free period is normally long enough to permit the later maturing lespedezas to mature seed. Korean lespedeza, the seed of which is cheaper and generally available, is the more practicable species at the present time.

Lespedeza can be successfully established by broadcasting the seed on untilled grass sod at any time from the first of December to the end of March. If the drill used to apply phosphate fertilizer has

*County Agents are trained and equipped to test the lime requirement of soil.

a grass-seeding attachment, seeding and fertilizing can be accomplished with one operation. Winter seedings of lespedeza are somewhat more hazardous than early spring seedings in southern Missouri because of premature warm weather followed by killing cold that sometimes occurs in that section.



Korean lespedeza with orchard grass.

In order to obtain a full first-year stand, sow lespedeza at the rate of 25 pounds of seed per acre. Once established, the stand of lespedeza will be renewed from year to year by natural reseeding.

GRAZING MANAGEMENT

Lespedeza cannot be established nor maintained in dense stands of pasture grasses unless grazing is properly managed. Fortunately the grazing schedule that promotes the growth and natural reseeding of lespedeza is neither complex nor wasteful of available forage.

Both Korean and common lespedeza are annuals that must start from seed each spring. Under the most favorable natural conditions, the seedlings grow slowly during April and early May. They cannot, at this stage, withstand excessive shading either by more rapidly growing plants or by plant residues left from the preceding growing season. They are also poorly equipped to compete during the cool weather of spring with the more vigorous grass for limited supplies of plant food and moisture.

Pastures that are to be fertilized, limed, and seeded to lespedeza should be grazed closely during the fall. Growth that cannot be pastured off should be mowed, raked, and burned or hauled away.

Each spring, including that which follows the initial seeding of lespedeza, grazing should begin in the permanent pasture as early as the grass is in vigorous growth. This will usually be late March or early April in south Missouri, mid-April in central Missouri, and late April in north Missouri. The number of livestock should be adjusted so that the grass in the permanent pasture will be utilized fully, but not overgrazed, by early July, when lespedeza in small grain stubble should be ready to pasture. The average improved pasture will carry one mature cow or two-year-old steer, or the equivalent in other ages and kinds of livestock, per acre from mid-April to early July.

If the lespedeza and annual weed-grasses make a large summer growth, this vegetation can be pastured off during late August and early September. From mid-September to mid-November the permanent pasture should be protected from grazing to permit the grass to restore food reserves depleted by intensive grazing during spring and early summer. Protection from grazing during the summer will not accomplish this because the northern perennial grasses, when grown in this latitude, store foods only during the cooler portions of the growing season. Close grazing retards food storage by reducing leaf area.

After November 15 in the northern, and December 1 in the southern part of the State, the summer and fall growth can be pastured off without harmful effect on the perennial grasses. Although less nutritious than the immature grass used during the spring, this partially dry grass is valuable for maintenance when other pasturage is usually not available.

Not only is it desirable to use this accumulated growth to conserve stored hay and grain, but it is essential to remove this plant residue in order to prevent it from retarding or suppressing the early development of lespedeza during the subsequent spring.

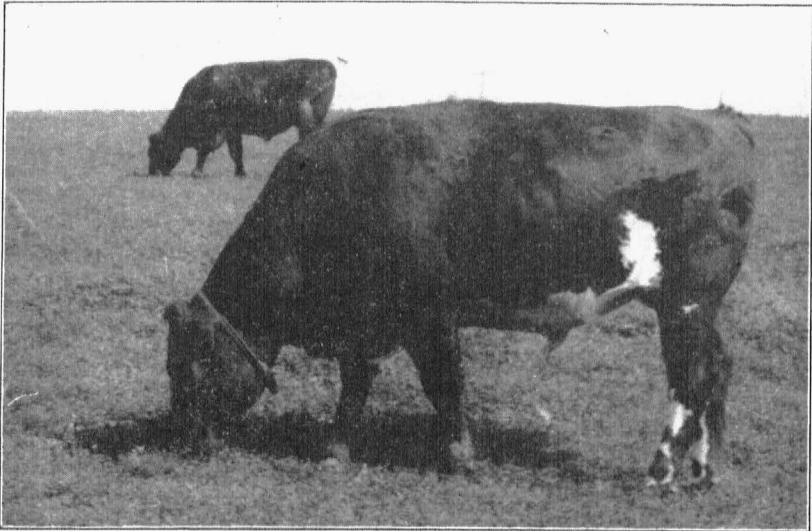
SUPPLEMENTARY PASTURES

The permanent pasture that has been fully utilized from April to July usually will not supply much forage during the summer. Even when summer rainfall is abundant, protection from grazing is advisable to permit maximum nitrogen fixation by the lespedeza. It is necessary, therefore, to provide supplementary pastures during mid- and late summer.

Korean lespedeza in wheat, oats, barley, or rye stubble will provide excellent pasture at small cost from early July to mid-September

for producing dairy cows, and to early October for all other livestock. The lespedeza in grain stubble will be affected less by summer drought than that in grass sod because it will have less competition for the limited soil moisture supply.

Sudan grass can also be used as supplementary pasture from early July to frost.



Steers pastured on bluegrass-lespedeza from April 21 to July 31, and on Korean lespedeza in wheat stubble from July 31 to September 19, with no other feed while on pasture.

Early sown rye or winter barley can be pastured during October and November, a period during which the permanent pasture should be protected from grazing. First-year sweet clover is also useful for this purpose, although close grazing during October will materially retard growth during the second year and may reduce the stand.

SUMMARY

Permanent pastures can be profitably improved by the combined action of a legume, plus phosphate fertilizer and lime. Although other legumes can be used and some, notably sweet clover, fix nitrogen more rapidly, the annual lespedezas have certain advantages for pasture improvement.

Kobe and other improved strains of common lespedeza are slightly superior to Korean lespedeza as pasture improvers in the southern

half of Missouri, but they mature too late for use in the northern half of the State. Seed of improved strains of common lespedeza is at present difficult to obtain and more expensive than Korean lespedeza seed.

Broadcast or drill lespedeza seed during the winter or early spring at the rate of 25 pounds of seed per acre on closely grazed but untilled sod.

Apply 20 per cent superphosphate, or its equivalent, at the rate of 500 pounds per acre in late fall or early winter. Drill or work the phosphate fertilizer into the sod.

Broadcast agricultural limestone at the rate indicated by soil test at any time of year that the weather and other farm work will permit.

Correct grazing management is essential for the successful establishment and maintenance of lespedeza in grass sod and for efficient use of available forage.

Pasture the grass closely prior to fertilizer application and the initial seeding. Each year start grazing as early as the grass is in vigorous growth, and pasture heavily enough to utilize fully the available forage by early July. Avoid overgrazing.

Provide lespedeza or sudan grass for summer supplementary pasture. Use early sown winter barley or rye, or first-year sweet clover during October and November.

A lush growth of summer weed-grasses and lespedeza, resulting from abundant summer rainfall, may be pastured off during late August and early September, but rest the grass from mid-September to mid-November or early December regardless of the amount of growth. Pasture off the accumulated herbage during the winter.