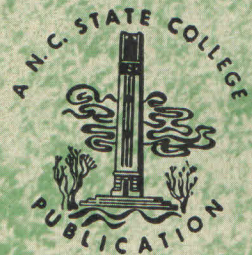


ANNUAL LESPEDEZAS

In North Carolina



Meet the Authors

S. H. Dobson, Agronomy Extension Specialist

C. H. Hanson, Research Associate Professor of Agronomy,
Agronomist, Agricultural Research Service, U.S.D.A.

W. W. Woodhouse, Professor of Agronomy

D. S. Chamblee, Associate Professor of Agronomy

J. C. Wells, Pathology Extension Specialist

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Annual Lespedezas

in North Carolina

Annual lespedezas cover a considerable acreage in North Carolina and have a variety of uses. About one-half million acres are cut for hay each year, this being about half the total hay acreage harvested in the state. In addition to the hay harvested, North Carolina is one of the largest producers of seed—harvesting around 150,000 acres each year. Annual lespedezas provide considerable supplementary grazing in the summer and fall, and are also used as soil conserving and soil improving crops.

VARIETIES

Common, Kobe and Korean have been the standard varieties for many years. There are two new varieties now being recommended, Rowan and Climax. A description of these varieties follows:

Common

Common lespedeza has been volunteering in the state for many years and was the first variety identified and used in the Southeast. It is a low grading variety and at present Common is seldom sown for hay or pasture, being replaced by taller growing and more productive varieties. Common seed are scarce.

Kobe

Kobe lespedeza is somewhat similar to Common, but has larger leaves, stems and seed. It is the latest maturing of the presently available varieties and is especially recommended on the nematode-free soils of the Tidewater and Coastal Plain section of the state. Kobe is also well adapted to the Piedmont section. In the high Mountain area, it is often killed by frost before the seed is mature.

Korean

Korean lespedeza is quite different in appearance and habit from Common and Kobe. It is both earlier to start growing in the spring and to mature in the fall. The leaflets are broader and the seed is borne mostly at the tips of the branches and not along the stem as in Kobe and Common. Korean is a relatively heavy producer of seed which can be combined easily.

Korean is better adapted to the northern and western parts of the state. Korean and Kobe overlap in the Piedmont section of the state.



Showing Seed of Each About Twice Their Natural Size

Two new varieties of Korean lespedeza are now available in the state and may eventually replace the old line parent strain of Korean. Both varieties have appeared promising in North Carolina and in a series of tests in seven states.

Table 1. Average Dry Hay Yields in Tons Per Acre for Four Lespedeza Varieties Tested in Seven States.*

State	No. of Tests	Variety			
		Rowan	Climax	Korean	Kobe
Georgia	3	.83	.92	.64	.84
Maryland	5	1.74	1.71	1.54	1.54
Mississippi	4	2.29	2.49	1.80	1.92
Missouri	7	1.87	2.01	1.42	1.78
North Carolina**	5	1.89	1.77	1.52	1.55
Oklahoma	6	1.54	1.65	1.28	1.55
South Carolina	3	1.86	1.89	1.63	1.60
Average		1.75	1.81	1.42	1.58

*Data obtained from report entitled, "1952 Annual Report of the Results of the Uniform Annual Lespedeza Variety Tests". Three additional tests from North Carolina have been included in the original table. Appreciation is expressed to workers in other states who conducted the tests, and to Mr. P. R. Henson, U. S. Department of Agriculture, who compiled the data.

**Raleigh, McCullers and Statesville. Does not include tests on heavily infested nematode soils, nor in the main Kobe area.

Rowan

Rowan is a new variety released by the North Carolina Agricultural Experiment Station in cooperation with the U. S. Department of Agriculture.

Table 2. Relative Susceptibility of Rowan, Korean and Kobe Lespedeza to Root-Knot Nematode Species, Based on the Number of Galls on the Roots.

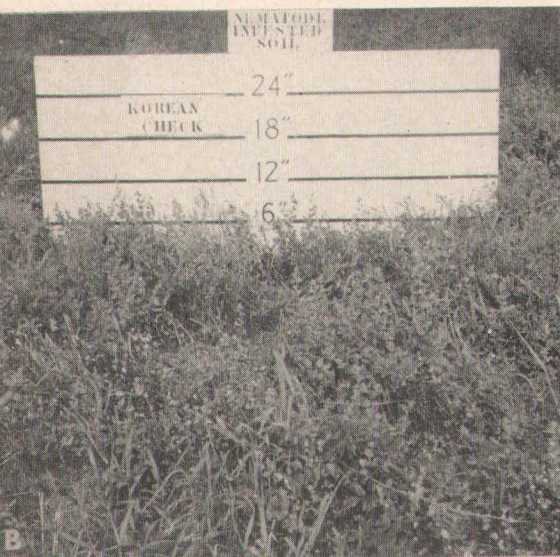
Species of Meloidogyne (Root-Knot Nematode)	Degrees of Root-Knot Susceptibility ^a		
	Rowan	Korean	Kobe
<i>M. arenaria</i>	66.6	78.0	56.8
<i>M. hapla</i>	95.8	95.8	81.2
<i>M. javanica</i>	71.4	75.0	71.0
* <i>M. incognita</i>	13.1	66.6	91.6
* <i>M. incognita</i> var. <i>acrita</i>	14.7	90.2	81.2

^a 0 = no galls and highly resistant, 100 = severely galled and very susceptible.

* The two most common species of root-knot nematode in North Carolina.



(A) Rowan Lespedeza growing on root-knot infested soil, Creedmoor, N. C.



(B) Korean Lespedeza growing on root-knot infested soil at Creedmoor, N. C.



(C) Left, Kobe and (D) Right, Rowan Lespedeza growing on root-knot infested soil at Creedmoor, N. C.

ment of Agriculture. It is a new, high-yielding variety of Korean lespedeza moderately resistant to two most common forms of root-knot nematodes (*Meloidogyne incognita* and *M. incognita var acrita*) See Table 2. It also has resistance to powdery mildew. In North Carolina, its superior yield has been particularly striking on nematode-infested soils. See Table 3. In nematode-free soils, differences between Rowan and Korean have been less striking; on these soils Rowan yields 5 to 20 per cent more.

Table 3. Dry Hay Yields in Tons Per Acre for Rowan and Two Susceptible Varieties Grown at Five Locations in North Carolina on Soils Differing in Degree of Root-Knot Nematode Infestation.

Variety	Degree of infestation and location				
	Heavy		Moderately heavy	Light	Absent
	Willard	Summerfield	Creedmoor	McCullers	Raleigh
Rowan	0.96	1.34	1.95	2.37	2.02
Korean	0.27	0.16	0.67	2.01	1.92
Kobe	0.53	0.37	0.84	2.08	1.96

Rowan is recommended throughout the area where Korean is now grown and in the Kobe belts where nematodes are a problem. The growing season, growth habits, and seed of Rowan are similar to Korean. Rowan seed yields are some higher (Table 5).

Climax

Climax is another improved variety of the Korean type which promises to boost lespedeza yields in the state. Climax is adapted to the same general area as Korean. It is taller and more upright than Rowan, but it is susceptible to root-knot nematodes. Seed yields are somewhat less than for Korean and Rowan. Climax is about two weeks later maturing than Korean and three weeks earlier than Kobe.

This difference in date of maturity of Climax seems to offer several advantages. (1) It would allow staggering of hay-making operations. (2) In the northern part of the Piedmont, it would delay the hay-making until after tobacco harvest; and (3) it would allow an extension of the grazing period from lespedeza by using the varieties of different maturity dates.

HOW TO GROW LESPEDEZA

Soils and Fertilizers

You can grow annual lespedezas on most North Carolina soils except very dry, sandy ones. Lespedeza will often tolerate a low

lime and fertility level better than most of the other forage legumes. However, without proper treatment this plant will further exhaust the soil resulting in lower and lower yields. The following table illustrates this with lime:

Table 4. Lespedeza Yields - Pounds of Hay Per Acre

	1945	1946	1947
Fertilizer and Lime	2074	3010	3293
Fertilizer, no Lime	2085	2266	1528

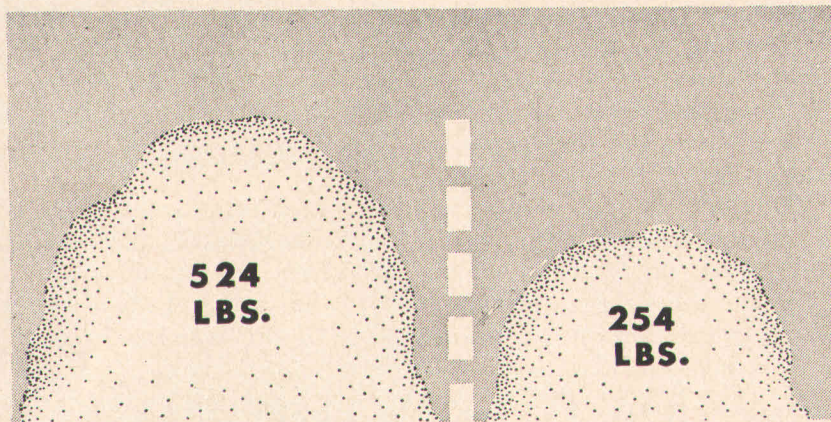
Lime and fertilizer had no effect the first year, but became more essential each succeeding year. In fact, the untreated soil would no longer support a stand after the third year.

Lespedeza is an excellent forage and soil improving crop, but the nutrients removed by it must be replaced by a good liming and fertilization program.

A soil test is always good business in determining how to lime and fertilize any crop. On soils not previously limed we recommend one to two tons as being sufficient for lespedeza. In the Piedmont, where lespedeza is grown following well fertilized small grains no more fertilizer is needed the first year. In the Coastal Plain 75 lbs. of muriate of potash should be added the first year. The second year's lespedeza crop should receive 300 to 400 pounds of 0-14-14 fertilizer per acre especially where hay is removed.

Seeding

Kobe, Rowan, Climax, Korean and Common lespedeza are summer annuals and are seeded in late winter and early spring.



Time of harvesting seed is important. In this experiment Korean Lespedeza yielded 524 lbs. of seed per acre on October 12th. Three weeks later, it yielded only 254 lbs. per acre. (N. C. Experiment Station)

They can be overseeded in small grain successfully, when the soil is usually moist and loose on top. However, drilling is quite satisfactory and will require less seed.

Annual lespedezas volunteer freely if the seed is allowed to mature and the soil is not disturbed. Following a hay crop cut on time, there is normally enough seed for a good volunteer stand the next year.

Due to a build-up of weeds, lespedeza is usually not used as a volunteer crop more than one or two years.

While it is not necessary to cover the seed, some loose dirt on the surface is advisable. Therefore, when seeding on a packed or hard surface, such as an old pasture, where the perennial legume has gone out, it would be better to scarify the surface with a disk or some such implement. This should be done before sowing the seed.

The rates on the back page are for broadcast seeding. The rates can be reduced by one-third if drilled. Inoculation is not believed necessary for most of the North Carolina soils.

USES

Hay

Lespedeza makes a high quality hay and is easy to cure. However, time of cutting is important. Generally, lespedeza should be cut when the plant reaches a height of 8 to 12 inches, when it begins to shed leaves, or blooms, whichever occurs first. It can usually be cut after dew is off in the morning and put up in the afternoon during clear, dry weather. During a good growing season, hay cut early will allow a second crop for seed or grazing. In lespedeza as in most other hay crops, the leaves contain most of the feed value.

Seed

Seed yields vary with the variety, the Korean type generally yielding more than Kobe (Table 5). It is important to harvest the seed crop as soon as the seed pods turn brown or immediately after the first killing frost, whichever occurs first. The seed begins to shatter soon after ripening. Tests on the North Carolina Experiment Station showed that the seed yields of Korean following winter wheat dropped from 540 to 254 pounds per acre when harvesting was delayed three weeks. A 50 per cent reduction in the yield of Kobe likewise occurred when the seed was not harvested until three weeks after it was mature. In these experiments, Korean was mature about October 12, Kobe about November 9.

Seed harvested early may contain green leaves, weeds, or some green seeds, and should be spread out to dry.

Table 5. Seed Yields of Lespedeza Varieties in Pounds Per Acre.

Variety	Raleigh, N. C.*				Statesville, N. C.**	
	1947	1948	1949	1950	1951	Ave.
Rowan	526	1062	573	***	316	619
Climax	512	730	681	360	200	497
Korean	583	960	521	546	247	571
Kobe	474	378	487	432	265	407

* In rows 2 1/2 feet apart

** Broadcast plantings following winter wheat

*** Not included in test

Grazing

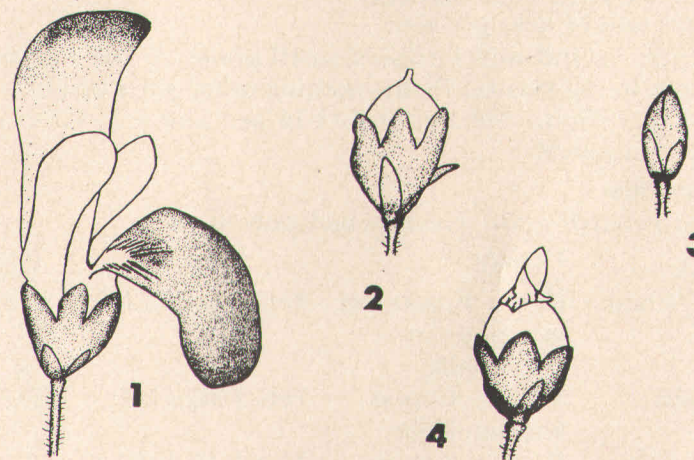
In addition to hay, lespedeza has found another real place in the overall forage program as a supplementary grazing crop. It is being used primarily in pure stand and affords grazing during July, August and September for all classes of livestock. Beef cattle do very well on lespedeza in October and November if the growth is allowed to accumulate. Lespedeza is also being used to a limited extent as the legume companion to Dallis grass and to orchard grass. The fact that it is an annual seems to limit its value in a perennial pasture sod.

The present varieties of lespedeza will afford more grazing if grazed rotationally and not too closely. Being a hot weather plant, lespedeza fits in nicely with Ladino clover pastures to take some of the load off the permanent pastures during the hot weather period. While lespedeza does not grow during dry weather, it does seem to hold its own and can be allowed to accumulate growth for some drought insurance.

Rotations

A considerable part of the total lespedeza acreage is grown in rotation with small grains. While the first year's growth is often suppressed by the small grain, the second year's growth usually gets started earlier and produces more hay or seed. Under this system lespedeza is seeded in small grain in the late winter or early spring and a crop of hay or seed harvested the first year leaving enough seed for a volunteer stand the next spring. The second year's growth is used for an early hay crop, or disked in early as a soil improving crop for fall seeded small grain. Since weeds build up in the third and fourth years, it is usually not advisable to leave lespedeza longer than two years.

A corn, small grain, lespedeza rotation is used on many farms. In such rotations lespedeza is a good soil improving crop, especially where only seed are harvested. Where hay is removed, it is still a soil improver if proper mineral fertilizers are added. In one experiment in North Carolina, lespedeza was grown for four years and harvested for hay each year. The lespedeza was then plowed and followed with corn. The non-lespedeza plot produced 25 bushels of corn per acre; the lespedeza plots produced 48 bushels per acre with no additional nitrogen in either case.



The Two Kinds of Flowers and Young Pods (Seeds) from these Flowers in Korean Lespedeza

Lespedeza has two kinds of flowers. First, there is the showy flower which can be easily seen (Fig. 1). The second type (Fig. 3) is the tiny, closed (cleistogamous) flower which is usually formed during cooler weather. The tiny, closed flower is about 1/10 as long as the showy one and has no showy petals. Both types of flowers produce seeds (Fig. 2 & 4). Young seed pods from the closed flowers usually can be identified by the old flower parts which form a temporary "cap" on the tip of the pod (Fig. 4). The fact that the seed crop may come entirely from the closed flowers explains the heavy seed crops which can be harvested in certain years when very few flowers have been seen. Studies have been made on the method of reproduction in each type which have greatly aided in the development of better varieties through breeding.

TO DO THE BEST JOB WITH LESPEDEZA

Know Your Varieties and Their Place -

- A. Common—no longer used extensively.
- B. Korean—Piedmont and Mountains—good seed and hay yields
 - (1) Rowan—same area as Korean—a little better than Korean in hay and seed production and especially superior on root-knot nematode infested soils.
 - (2) Climax—same area as Korean—two weeks later maturity—some fewer seed but more hay than Korean.
- C. Kobe—Coastal Plain and Southern Piedmont—later to start growth and 3 to 5 weeks later to mature than Korean.

Lime and Fertilize - Use Soil Test

- A. 1 to 2 tons of lime per acre.
- B. 1st year behind well fertilized small grain—75 lbs. muriate of potash in the Coastal Plain—nothing other parts of the state—2nd year 300 to 400 lbs. of 0-14-14 per acre especially where hay is removed.

Seed on Time -

- A. Seed in small grain, pastures and pure stand

<u>Seeding</u>	<u>Variety</u>	<u>Date</u>	<u>Rate*</u>
Coastal Plain	Kobe: Rowan on nematode in- fested soils	Feb. 1-March 15	20-40 lbs.
Piedmont	Rowan, Climax, Korean, Kobe	Feb. 1-March 31	20-40 lbs.
Mountains	Rowan, Korean	March 15-April 15	20-30 lbs.

* Kobe 30 to 40 lbs.—Korean, Rowan, Climax 20 to 30 lbs.

Use and Manage Properly -

- A. For Hay—Cut when 8-12 inches high, leaves begin to shed or when blooms appear, whichever occurs first—cut in the morning and put up in the afternoon.
- B. For Seed—Combine seed early—as soon as pods turn brown
 - Korean and Rowan—1st part of October.
 - Kobe—1st part of November.
 - 3 weeks delay cuts seed yield in half.
- C. For Grazing—Good summer supplementary grazing—also good fall grazing for beef cattle, dry cows and young animals—rotate grazing—avoid close grazing.
- D. For Soil Improvement—Use in corn, small grain, lespedeza rotation as soil conserving and soil improving practice. Seed idle land to lespedeza.