

OSU  
Collection



# Will It Grow in Oklahoma?

A Summary of Tests and Observations on the  
Oklahoma Adaptation of New and  
Unusual Crops

L. L. Ligon

OKLAHOMA AGRICULTURAL EXPERIMENT STATION  
BULLETIN B-307

MARCH, 1947



# Contents

FIBER CROPS .....	6
Flax .....	6
Hemp .....	6
Ramie .....	6
MISCELLANEOUS CROPS .....	7
Buckwheat .....	7
Guar .....	7
Teosinte .....	7
OIL-BEARING CROPS .....	7
Bene .....	7
Castor Beans .....	7
Okra .....	8
Perilla .....	8
Safflower .....	8
Sesame .....	8
Sunflower .....	9
RUBBER CROPS .....	9
Guayule .....	9
Russian Dandelions .....	9
SUMMER LEGUMES FOR SEED AND GREEN MANURE .....	10
Cassia tora and <i>C. occidentalis</i> .....	10
Crotalaria .....	10
Kudzu .....	10
Lupines .....	10
Sesbania .....	11
Tepary Beans .....	11
Velvet Beans .....	11
WINTER LEGUMES AND COVER CROPS .....	11
Caley Pea (Singletary Pea) .....	11
Canada Field Pea .....	11
Creole Peas .....	12
Dixie Peas .....	12



# WILL IT GROW IN OKLAHOMA?

## A Summary of Tests and Observations on the Oklahoma Adaptation of New and Unusual Crops

By L. L. LIGON  
Associate Agronomist

The Experiment Station for many years has regularly tested new crops which might have a place in Oklahoma. Public interest in these tests has recently shown a great increase, as evidenced by the mounting number of inquiries concerning them. This bulletin, therefore, was prepared to summarize results of new crop tests made during the past few years.

The present interest in new crops stems from four sources:

1. The awakening to the evils of the one-crop system has stimulated a desire for new sources of farm income.
2. Realization of the loss through soil erosion and fertility depletion has created a demand for more and better soil-conserving and soil-building crops.
3. Cutting off by the war of our foreign sources of vegetable oils led to the search for oil-bearing crops for food and industrial use.
4. Reduction of cotton acreage so reduced the supply of cottonseed meal for stock feed that other sources of vegetable protein were needed.

The Station's tests of crops which might meet one or more of these needs have an important place in the research program, and additional information will be available later. Persons interested in the possibilities of some specific crop are invited to write for information. The tests are set up to make it possible to answer questions such as:

- Will this crop grow in Oklahoma?
- What can it be used for?
- Is it a summer or winter crop?
- When should it be planted, and how?
- How can it be harvested?
- Is there a market, or other use such as soil fertility improvement?

## FIBER CROPS

**FLAX.** Seven varieties of flax were grown under competitive yield tests at Stillwater for the 4-year period, 1942-45. The best yields were produced by Victory, C. I. 1045, 7.9 bushels; Redson, C. I. 970, 7.8 bushels; and Bison, C. I. 389, 7.5 bushels per acre. In this same test, Crystal, C. I. 982, produced an average of only 5.5 bushels per acre. At the Woodward Experiment Station, Victory produced an average of 7.6 bushels per acre for the 3-year period 1943-45. Bison, next in rank, produced 7.3 bushels; and Redwing, C. I. 320, last in yield, only 5.9 bushels for the same period.

In experiments at Stillwater to determine rates and dates of seeding for best grain yields, Linota and Bison each were seeded at 14-day intervals beginning January 14 and ending April 15 in 1942, and beginning February 14 and ending April 2, 1944. The seeding rates were 20 and 40 pounds per acre. Both varieties responded best from the early March (March 2) seeding. Only slight and perhaps insignificant differences were noted for the two rates of seeding.

Flax should be sown on a well compacted seedbed, or better yet, on a fall-plowed seedbed. The land should be disked and harrowed (floated if very uneven) before drilling. This makes an even, fine-textured seedbed and insures uniform depth of planting. Flax does not combat weeds well, and for this reason should be sown immediately after working the soil.

**HEMP.** A summer annual crop grown for its seed and fiber. The fiber is used in the manufacture of rope, binder twine, and burlap bags. The seed is grown for planting and as a source of narcotics.

The best fiber is produced when the seed is drilled thickly to prevent branching. The fiber produced in Oklahoma is of inferior quality and the seed production is very erratic. The growing of hemp is regulated by the narcotic laws of the United States.

The growing of hemp is not recommended in Oklahoma.

**RAMIE.** A fiber-producing perennial plant, the fibers of which compete with cotton. It is grown on a comparatively small scale in Florida and South Texas. It requires a humid climate with high rainfall and will not grow in Oklahoma.

### MISCELLANEOUS CROPS

**BUCKWHEAT.** An excellent quality honey is manufactured by bees from the buckwheat flower. The seed are also in demand for grinding into buckwheat flour. A yield of eleven bushels of seed was secured in 1944 from a crop of buckwheat planted April 3. The crop planted March 22, 1945, was killed by frost in late March and a replant on April 10 failed because of dry weather. A field planted March 25, 1946, gave a yield of 900 pounds or 15 bushels of seed when combined on June 15.

The indications are that buckwheat should be drilled in about corn planting time, and there are also possibilities that it can be used as a fall crop to be planted in August if there is sufficient moisture to bring the seed up.

**GUAR.** Guar is a summer annual legume available in the southwest irrigated regions as a green manure crop and to the paper making industry for the mucilage contained in the seed. The crop was introduced into Oklahoma tests in 1944. The plant growth was poor; seed production was low; and the crop was destroyed during the hot dry months of July and August by a virus disease new to Oklahoma. The poor showing and the fear of spreading this new disease to other legumes caused this crop to be eliminated from further tests.

**TEOSINTE.** This crop will produce a fair amount of forage but little or no seed when planted in Oklahoma.

### OIL-BEARING CROPS

**BENE.** This legume is grown for its pungent, oil-bearing seeds which are chiefly used in the manufacture of cakes and candies. It produced no seed when planted near Stillwater, and the tonnage of forage for green manure was too low to compete with other legumes which produce seed as well as forage.

**CASTOR BEANS.** Caster beans are not a legume and are therefore not to be considered as a soil building crop. Their culture is similar to that required for corn. The planting date in this state ranges from April 1 to May 20. The oil content of the whole seed ranges from 40 to 55 percent. One hundred pounds of pods will usually shell out from 70 to 75 pounds of beans. Early work at the Oklahoma Station (1902) stressed the use of early varieties for high yields. The leading variety grown during the last few years in Oklahoma (1941-43) is Conner. Several other varieties are being studied in a variety

test. The usual range in yield has been from about 400 to as high as 1500 pounds per acre. Irrigated land has produced more. This crop is usually planted in 42-inch rows with plants from two to four feet apart in the row, depending on the fertility of the soil. With soils of high fertility the spacing should be wide.

Neither the quality nor the percentage of oil seems to be affected by the fertility, type of soil, nor section of the state where the crop is grown. The yield did show some variation.

The chief obstacle to the profitable growing of castor beans in Oklahoma is the lack of a ready market.

*OKRA.* Good yields of seed were obtained with Clemson Spineless and Louisiana Green Velvet varieties, but the oil content was low and of very poor quality.

*PERILLA.* This crop, tried for the first time in 1946, was not successful. The seed planted was several years old and consequently the germination was very poor. The few plants produced were not enough for a competent test. Perilla will be planted again in 1947.

*SAFFLOWER.* A thistle-like plant grown in the southwestern part of the United States. During the several years in which this crop was tried it was only fairly successful in producing seed, and the oil content was found to be below standard in yield and quality. It is not recommended at present. Safflower is planted about spring oats planting time. It is drilled with a grain drill at a rate of 50 to 100 pounds per acre and can be harvested with a combine. In 1942 it yielded 544 pounds of seed per acre but had a very low oil content (6 to 7 percent).

*SESAME.* The first year's test with this crop was very successful. The plants passed through the summer drought in excellent shape. A good yield of seed was obtained. The plant has a compact habit of growth with upright branches and bears its numerous seed pods on short peduncles along the upper part of the stems and branches, so that it will combine easily. The chief problem is in harvesting the seeds, as the pods ripen progressively and open immediately on ripening. If strains with closed pods can be developed and markets obtained, sesame will have possibilities for growing in Oklahoma.

Sesame oil is used for salad oils, cooking oils, and for other purposes to which a vegetable oil is suited. The seed are in demand by bakers for seasoning of bread and pastries.



**SUNFLOWER.** Sunflowers have been grown in the United States for several purposes including silage, grain, and oil. Some new selections made primarily because of their oil content are being experimentally grown.

The seeds contain 14 to 26 percent of highly edible oil and are also valuable as a source of protein feed for chickens and other livestock. Sunflower silage has about two-thirds the value of corn or grain sorghum silage for beef cattle.

The semi-dwarf types such as Mennonite and Sunrise which are suitable for combine harvesting are now under test. Seed yields of 400 to 750 pounds have been obtained from these types (see Table I).

Table I.—Sunflower Yields

	Pounds Seed	Tons Dry Forage	Percentage of Oil
Sunrise S488	451	0.48	21.83
Sunrise S490	617	0.76	21.70
Mennonite C	661	0.58	16.98
Mennonite ND	749	0.50	16.51
S-37-388-1-1-5	699	0.43	18.13
Sunrise ND	385	0.59	21.62

The sunflowers are planted about May 15, and thinned June 1. Normal cultivation is used until the plants are too tall. The crop can be harvested in September after the seed are mature. Sunflower growing is recommended only where a ready market is available.

### RUBBER CROPS

**GUAYULE.** Seedlings and seed of this shrub have been planted. In all cases the plants have been unable to tolerate winter conditions at Stillwater. The seedlings planted in the spring of 1942 made a nice summer growth and came into bloom, but no seed were observed.

**RUSSIAN DANDELIONS.** Seedlings of this plant were made in the fall of 1942 and spring of 1943 but the results were unsatisfactory. Weather conditions were unfavorable, but most other southern plantings have also been unsatisfactory. No further work is contemplated.

## SUMMER LEGUMES FOR SEED AND GREEN MANURE

**CASSIA** *tora* and *C. occidentalis*. These legumes show great promise as summer green manure crops or for the production of seed for planting. Planted in rows for cultivation, Cassia grows to about five feet tall and produces large amounts of readily combined seed. One to three tons of organic matter are obtained in this manner of planting also.

At the present time, there is no known inoculation for this legume, so no additional nitrogen is added to the soil when the plants are plowed under. Investigations are under way to determine the full possibilities of this legume and to find the inoculation for it. It is not recommended at this time.

**CROTOLARIA**. Eighteen species and types are under test, including several strains of *C. spectabilis*. Seed production is very erratic. *C. spectabilis* (early and late), *C. striata*, and *C. intermedia* are most consistent in seed production.

*C. spectabilis*, a compact, large leafed, upright growing species, produces large amounts of seed and a heavy plant growth. It produces its seed in spikes above the foliage and is easily combined. This type can be recommended for planting.

Crotolaria is strictly a green manure crop and cannot be used for hay as most of the species are poisonous to livestock.

**KUDZU**. Kudzu is a long-lived perennial vining legume. It is a profitable crop for those regions with 40 or more inches of rainfall and mild short winters. The only part of Oklahoma which is in general suitable for Kudzu is the southeastern section where the rainfall is more than 40 inches.

Kudzu is established by planting the crowns or roots, using about 500 to the acre. It should be planted in April on well-drained, sandy loam soils. Normal cultivation for weed control should be practiced the first year.

Kudzu, in southeast Oklahoma, where adapted, is a good soil builder, a soil binder, and a hay crop. It can be pastured only for short periods as it is easily damaged by long periods of grazing.

Kudzu makes excellent hay but is difficult to harvest because of its long vines.

**LUPINES**. Several types of lupines for seed and green manure crops have been tried. All were killed by the summer heat or drought or made very little growth.

**SESBANIA.** This legume is grown as a soil building green manure crop. The plants have woody stems and sparse foliage with small leaves, especially when planted in cultivated rows. In such plantings *Sesbania* is six to eight feet tall, much branched, and has coarse woody stems and branches. Seed production is abundant; 333 pounds to the acre is recorded in Oklahoma tests. In 1944, 1.78 tons of air dry organic matter was produced by this method of planting.

In 1945 *Sesbania* planted with the grain drill at the rate of 40 to 60 pounds of seed to the acre grew to the height of about three feet, produced no seed, but did produce 11.36 tons of green matter or three tons of dry matter per acre.

**TEPARY BEANS.** Tepary beans are grown for both the edible seed and for forage and green manure. A ten year average of slightly less than one ton of air dry forage has been recorded. This is somewhat less than cowpeas and other legumes. The crop is spring planted and harvested in July or August.

**VELVET BEANS.** A valuable hay, pasture, and green manure crop in the South. It does not grow well under most Oklahoma climatic conditions and is not recommended for general state planting, but might be worth trying in southeastern Oklahoma.

## WINTER LEGUMES AND COVER CROPS

**CALEY PEA (*Singletary Pea*).** A winter legume new to Oklahoma but one which has been growing for some years in parts of Texas and other southern states.

This pea is of wild origin where it has been observed to produce an abundance of seed and a fair amount of vines.

It has survived two winters in Oklahoma but needs additional test before its place and usage can be fully determined. Planted in October 1945, it proved to be somewhat slower growing than vetch or winter peas in the early spring months. The yields obtained were 1006 pounds of seed and 2.14 tons of air dry forage to the acre.

**CANADA FIELD PEA.** This northern summer legume has been tested with varying success in the past. Additional investigations are under way.

*CREOLE PEAS.* These are sometimes used for a winter cover crop in Louisiana but are not winter hardy in Oklahoma. Experiments are in progress to learn their adaptation for spring planting in Oklahoma and to develop a winter hardy strain. At present they have no place in Oklahoma.

*DIXIE PEAS.* This pea is an early strain of Austrian Winter peas selected some years ago in Oregon. It has been tried with success for several years in a number of southern states. It has proven to be three to four weeks earlier than Austrian Winter Peas.

Dixie peas were tried for the first time in Oklahoma in 1945. Planted on November 13 it was in full bloom by April 10. A small seed supply necessitated a thin planting, but on April 9 this pea had produced 0.43 tons of dry material for plowing under. Later, about May 1, 589 pounds of seed per acre were combined. On April 10 the plants were 16 inches tall while nearby Austrian Winter Peas planted at the same time and rate were about 6 inches tall with no blooms.

As little is yet known about the proper dates of planting, true winter hardiness, and resistance to disease, the Dixie Pea is not yet recommended for general planting.