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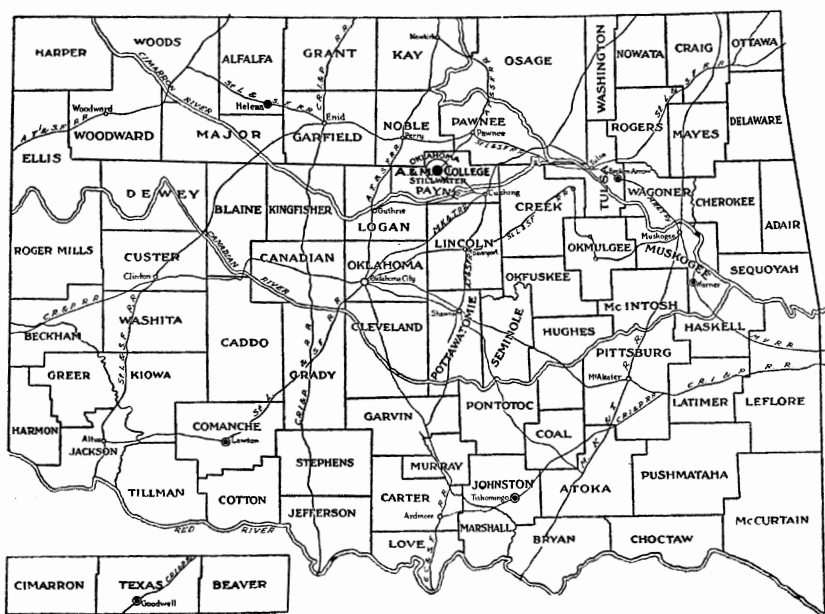
AGRICULTURAL EXPERIMENT STATION

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COWPEA CULTURE

BY O. O. CHURCHILL  
DEPARTMENT OF AGRONOMY



LOCATION OF A. & M. COLLEGE AND SIX SECONDARY AGRICULTURAL SCHOOLS

STILLWATER, OKLAHOMA

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 EXPERIMENT STATION, Stillwater, Oklahoma.

# COWPEA CULTURE

BY O. O. CHURCHILL, *Agronomist*

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## INTRODUCTORY

Cowpeas are not, comparatively, an important crop in Oklahoma. They are, however, grown to some extent in all parts of the State. Few farmers are growing large areas of cowpeas.

The great value of cowpeas makes them worthy of more extensive culture. They have many important uses.

Cowpeas are quite commonly grown as a catch crop following oats and wheat or are seeded in corn or kafir at the last cultivation. This practice is suitable only in certain localities and under certain conditions. In these cases they are used for hay or pasture.

Cowpeas make a good crop for soil improvement.

They may be used for green manuring and, due to being a legume, they add a valuable quality of vegetable matter to the soil.

Being a legume, cowpeas utilize the nitrogen of the soil air through the agency of bacteria.

In this State they will have to occupy an important place in rotations.

Cowpeas make a good feed for livestock. Both the forage and the grain make excellent feed.

Several varieties of cowpeas are quite suitable for table use.

The growing of legumes, such as cowpeas, improves the physical condition of the soil. It will make heavy soil work more easily.

## Experiments Being Conducted

Several experiments are being conducted by the Agronomy Department to determine the best methods of growing and handling this crop. However most of the work is devoted to variety testing.

The experiments being run are:

1. Variety testing.
2. Rotations.
3. Planting in corn and kafir.
4. Selecting and breeding.

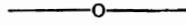
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## HISTORY

Cowpeas are probably a native of India. They have been extensively grown in China, India and other eastern countries. They were introduced

into the West Indies about the middle of the Seventeenth century and were introduced into the United States at a little later date.

In the United States the culture of cowpeas is confined largely to the South. However during recent years their growth has been extending northward. At this time they are grown to some extent as far north as Ohio and Michigan. Their greatest value will be found in their use in southern agriculture.



### BOTANICAL CHARACTERS

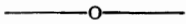
The cowpea is an annual belonging to the family Leguminosae. There are several very closely related species belonging to this family. Most writers at this time class the cowpea under the scientific name of *Vigna unguiculata*.

Cowpeas show a great amount of variation in their habits of growth. Some varieties are bunch-like, others are trailing; and all intermediate stages are found, as will be seen in the classifications which follow.

The habit of the plant depends to some extent upon the soil, climatic conditions and the rate of planting. The cowpea is not a true climber. It will, however, twine about objects such as corn and kafir plants to some extent. The leaves and stems are smooth. The leaves are divided into three parts or are trifoliate.

The flowers vary in color, being whitish, yellowish or purplish and are formed singly. The pods also vary in color, although in most varieties they are straw-colored. They vary in length from a few inches to fifteen or twenty inches. The color of the seeds show marked variations. Most of the varieties have smooth seeds. The color of the seed is given under classification. It is not uncommon to have brown or black rings around the scars. This gives rise to such names as "blackeye" and "browneye".

Cowpeas very seldom cross naturally in the field. In fact, it is very difficult to produce hybrids under field conditions.



### CLASSIFICATION

Cowpeas show a great diversity of form and size in both vines and seeds. Many hybrids have been produced. Many varieties resemble each other. While a great deal of work has been done toward completing the classification of cowpeas, there is still much to do.

### Classification According to Purpose

Grain Production	Forage Production	General Purpose
California Blackeye Mount Olive Ramshorn Early Blackeye	Whippoorwill Red Ripper Yellow Crowder Iron Clay Black Brabham Black Unknown New Era	Speckled Crowder Whippoorwill Red Ripper Lady New Era Grit Taylor

### Classification According to Habit

Trailing Vines	Erect Vines	Bunch Vines
Taylor Black Unknown Red Ripper Black Clay Lady Yellow Crowder Whippoorwill	Brabham Wonderful New Era Whippoorwill Grit Mount Olive Iron	Ramshorn Early Blackeye California Blackeye

### Classification According to Seed

Variety	Form	Size	Color
Blackeye	Kidney	Medium	White
Brabham	Kidney	Medium	Buff
California Blackeye	Kidney	Medium	White
Black	Kidney	Medium	Black
Clay	Kidney	Medium	Cream
Grit	Kidney	Medium	Cream
New Era	Kidney	Medium	Brown speckled (blue background)
Red Ripper	Kidney	Large	Dull red
Taylor	Kidney	Large	Speckled buff
Lady	Nearly round	Small	White
Yellow Crowder	Crowder	Medium	Cream
Wonderful	Kidney	Medium	Buff
Iron	Kidney	Medium	Buff red
Ramshorn Early	Kidney	Large	White
Unknown	Kidney	Medium	Buff
Speckled Crowder	Crowder	Large	Brown speckled
Whippoorwill	Kidney	Medium	Brown speckled
Red Crowder	Crowder	Small	Deep red
Gray Crowder	Crowder	Medium	Buff gray
Holstein	Kidney	Large	Spotted
Browneye	Kidney	Medium	White

### Classification According to Time of Maturity

Early	Medium Early	Medium	Late	Very Late
California Blackeye Ramshorn Early Blackeye	Brabham Red Crowder	Spk. Crowder Whippoorwill Yellow Crowder New Era Mount Olive Cream Wonderful	Red Ripper Iron Taylor Grit Blackeye White Crowder	Lady Black Clay Unknown Wonderful

In studying the tables under classification of varieties it is well to remember the following points:

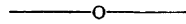
Rich soil tends to produce a vigorous growth of vines.

A liberal supply of moisture also tends to produce a great development of vines.

Early planting generally tends toward producing a greater amount of vines.

Under the conditions which tend toward excessive growth of vines, seed production is usually low. Seed production is also lowered greatly by drouth. If the drouth is very severe it is probable that no seed will be produced.

The habit of the plant depends to some extent upon the rate of planting. Some plants will have a trailing habit of vine when thinly planted, but grow in a more or less erect way if planted thickly.



## VARIETIES

A very great number of varieties of cowpeas have been listed by the seed companies at one time or another, still there are only about forty varieties that are of much importance in the United States. Comparatively few varieties have been studied in detail. Only a few varieties are recommended for general culture at this time by the different Stations.

In deciding upon a variety, the purpose for which it is to be grown must be considered. Some varieties produce a heavy crop of peas and little hay,

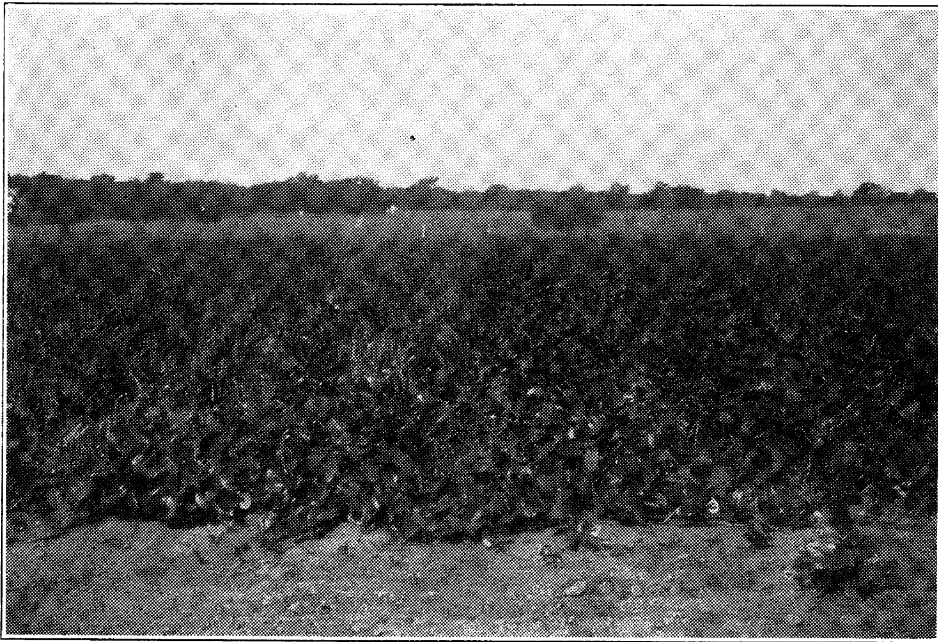


Figure I.—Variety test of Cowpeas, showing two plots of widely varying habits

others produce heavy yields of hay and practically no grain, and there are still others which produce a good quantity of both peas and hay.

More than thirty varieties of cowpeas have been tested at the Oklahoma Experiment Station.

From a careful study of the characteristics and production of all varieties tested we conclude that the Speckled Crowder, Whippoorwill and New Era are the best varieties for Oklahoma. The habit of growth of each of these varieties is upright hence they may be easily harvested. For general production there is no great difference between these three varieties. The Station prefers the Speckled Crowder. Under the conditions at the Station it has proved to be the most satisfactory.

The variety of cowpeas known as Warner's Extra Early has not been tested at the Station. We have had several very favorable reports concerning this variety. It is a more prolific fruiter and produces a greater growth of vines than the Whippoorwill.

Warner's Extra Early has the additional favorable characteristic of not shattering. The seed will not shatter even if the grain is allowed to become thoroughly ripe. The crop can be handled in almost any way without any danger of loss from shattering.

Due to the difficulty of threshing the seed clean this variety will seldom be found on the market. The pods are so tough that portions will remain on the peas when threshed. If all the pod is removed it is quite likely to remove the surface "skin" from the grain. This variety should prove to be quite valuable for hay production.

### Variety Cowpeas—1911

Hay Cut September 23, 1911

Plot.	Variety.	Total Pounds Per Plot.	Percent Peas to Pod.	Total Tons Per Acre.	Bushels Grain Per Acre.
1	Speckled Crowder.....	262.6	75.9	1.31	4.96
2	Whippoorwill .....	356.0	62.5	1.78	.89
3	Whippoorwill .....	521.0	.....	2.60	.00
4	Red Ripper.....	402.2	72.9	2.01	.80
5	Red Ripper.....	357.2	68.9	1.78	.59
6	Yellow Crowder.....	348.6	.....	1.74	.00
7	Lady .....	344.3	.....	1.72	.00
8	New Era.....	232.6	64.5	1.16	5.82
9	Iron .....	342.2	87.1	1.71	6.25
10	California Blackeye.....	198.2	75.9	.99	8.71
11	Mount Olive.....	237.7	65.9	1.18	6.30
12	Grit .....	312.0	.....	1.56	.00
13	Speckled Crowder .....	198.8	72.2	.99	1.39
14	Whippoorwill .....	385.3	64.1	1.92	.96
15	Whippoorwill .....	513.0	.....	2.56	.00
16	Red Ripper.....	344.3	73.9	1.72	2.01
17	Red Ripper.....	307.5	68.2	1.53	2.50
18	Yellow Crowder.....	329.0	.....	1.64	.00
19	Lady .....	316.5	66.9	1.58	.64
20	New Era.....	196.7	64.3	.98	3.30
21	Iron .....	278.7	60.2	1.39	1.35
22	California Blackeye.....	196.7	72.4	.98	7.98
23	Mount Olive.....	217.2	64.7	1.08	5.23
24	Grit .....	285.8	61.8	1.42	2.17
25	Clay .....	272.0	.....	1.36	.00
26	Black .....	312.0	.....	1.56	.00

Plot.	Variety.	Total Pounds Per Plot.	to Pod. Percent Peas	Total Tons Per Acre.	Bushels Grain Per Acre.
27	Red Ripper.....	291.0	.....	1.45	.00
28	Taylor .....	391.5	59.5	1.95	.67
29	Brabham .....	387.0	.....	1.93	.00
30	Whippoorwill .....	385.1	65.6	1.92	.48
31	Black Unknown.....	486.0	.....	2.43	.00
32	New Era.....	335.4	64.3	1.67	5.32
33	R. E. Blackeye.....	200.6	80.5	1.00	10.14
34	Wonderful .....	428.0	.....	2.14	.00
35	Taylor .....	470.0	62.5	2.35	2.67
36	Brabham .....	494.0	.....	2.47	.00

## Variety Cowpeas—1912

Plot.	Variety.	Maturity.*	Pounds Hay per Plot.	Pounds Pods per Plot.	Grain per Plot Pounds.	Tons per Acre.	Pods per Acre, Pounds.	Grain per Acre, Pounds.
1	Speckled Crowder.....	Medium	170	62.00	48.0	.85	620	480
2	Whippoorwill .....	Medium	310	14.00	8.0	1.55	140	80
3	Red Ripper.....	Late	386	10.00	7.0	1.93	100	70
4	Red Ripper.....	Late	267	34.00	21.5	1.34	340	215
5	Yellow Crowder.....	Medium	246	42.00	27.0	1.23	420	270
6	Lady .....	Very late	295	3.00	1.5	1.48	30	15
7	New Era.....	Medium	229	42.00	27.0	1.14	420	270
8	Iron .....	Late	379	24.00	14.0	1.89	240	140
9	California Blackeye.....	Very late	302	30.00	20.0	1.51	300	200
10	Mount Olive.....	Medium	162	52.00	31.0	.81	520	310
11	New Era.....	Medium	218	39.00	24.0	1.09	390	240
12	Taylor .....	Late	318	31.50	16.0	1.90	315	160
13	Cream .....	Medium	144	59.00	42.5	.72	590	425
14	Speckled Crowder.....	Medium	147	64.00	48.5	.73	640	485
15	Whippoorwill .....	Medium	278	15.75	11.0	1.39	158	110
16	Red Ripper.....	Late	358	10.75	7.0	1.29	108	70
17	Red Ripper.....	Late	265	38.50	23.5	1.32	385	235
18	Lady .....	Very late	304	3.00	15.0	1.52	330	150
19	New Era.....	Medium	187	50.00	31.0	.93	500	310
20	Iron .....	Late	333	34.00	18.5	1.66	340	185
21	California Blackeye.....	Very late	217	50.50	32.5	1.08	505	325
22	Mount Olive.....	Medium	175	59.50	36.0	.87	595	360
23	New Era.....	Medium	196	30.50	20.5	.98	305	205
24	Taylor .....	Late	194	25.75	13.0	.97	258	130
25	Cream .....	Medium	142	60.50	43.5	.71	605	435
26	Whippoorwill .....	Medium	248	24.50	14.0	1.24	245	140
27	New Era.....	Medium	182	56.00	34.0	.91	560	340
28	Ramshorn Early Blackeye .....	Very Early	188	74.50	52.0	.94	745	520
29	Taylor .....	Late	308	.....	.....	1.54	.....	.....

\*With reference to maturity, very early means less than 90 days when seeded in May. Early means from 90 to 100 days. Medium means from 100 to 115 days. Late means from 115 to 130 days, and very late means more than 130 days.

## Variety Test—1913

In 1913 the cowpeas were planted on May 22. All varieties were planted under identical conditions in every respect.

Owing to the very dry conditions which prevailed in 1913 practically no seed was formed by any variety. This season gave an unusually severe test



so far as seed production was concerned. For this reason notes on the different varieties are given somewhat in detail.

Notes were taken July 22. At this time the vines were green and in good condition. The effect of the drouth had not yet begun to appear.

Notes were taken again on August 29. At this time the vines were dead and practically all growth had ceased.

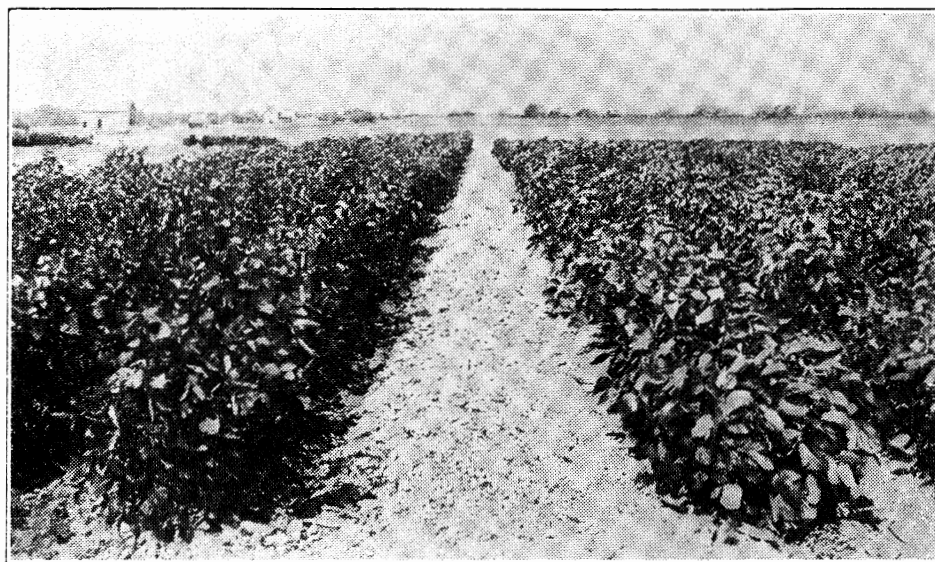
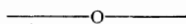


Figure 2.—Variety test of Soy Beans, showing two plots



### VARIETY COWPEAS—1913

Field Notes July 22, 1913—All Varieties Were Seeded May 22

**Plot 1. Speckled Crowder.**—A characteristic dark green color. Leaves medium to small, pointed in shape, tendrils inclined to grow considerably upward, even though unsupported. Not a creeping or twining variety.

At this date the surface of the ground is fairly well covered, though it can be readily seen between the rows. The plants are thrifty and have made a vigorous growth. The stand is very good—a condition not always found with the Crowder variety. The vines are approximately one foot high. There are no blossoms and very little indications of blossoms forming.

**Plot 2. Whippoorwill.**—Light green in color, leaves large and heart-shaped, somewhat speckled with light spots and slightly wrinkled in appearance. Very few runners or tendrils—these are inclined to grow upward—very much on the bunch type. Surface of the ground is about half covered at this time. Vines have a fairly good color, though the condition is somewhat affected by the dry weather. Some dead leaves. Blossoms seem about ready to open, but there are only a few buds present.

**Plot 3. Red Ripper.**—Vines are light green in color. Leaves are small and pointed like the Speckled Crowder, though considerably smaller. The leaves seem to point upward or “stand on end”. Tendrils are very plentiful.

At this time the vines stand about one foot and ten inches high and the surface of the ground is nearly covered. Vines appear very vigorous and do not seem to be affected at all by the drouth. No blossoms at this time.

**Plot 4. Red Ripper.**—Distinctly different from Plot 3. These vines are dark green in color; large, oval leaves; no creepers or tendrils; approach the bunch type. The growing points extend out laterally and point upward but very little. This variety resembles the Whippoorwill of Plot 2 more closely than the Red Ripper of Plot 3.

At this time the surface of the ground is about three-fourths covered and the vines are about one and one-half to one and three-fourths feet high. The vines appear very thrifty and are not suffering for moisture, except that there are no blossoms.

**Plot 5. Yellow Crowder.**—Light green in color with small, pointed leaves, but not distinctly pointed. Numerous tendrils extend both upward and outward. Some run prostrate on the ground. In some places the vines are matted together between the rows. This is not a typical vining or creeping variety, but more on the semi-bunch type.

At this time the ground between the rows is fairly well covered. Vines are approximately two feet high. No signs of blossoms. There are a few pods formed at the west end—seems to be due to a mixture.

**Plot 6. Lady.**—Dark green in color. Medium size to small leaves. No tendrils or runners—vines grow out laterally more than upward. While the branches or vines are found right at the surface, yet this variety approaches more of a bunch type than a trailing type.

At this time the surface of the ground is about half covered and the vines are about a foot and a half high. They look well, but there are a few dead leaves; no blossoms present.

**Plot 7. New Era.**—Leaves are a characteristic pale green color, with some light spots. The leaves are medium to large and extend out laterally with the tips pointing downward. Leaves and stems form a very dense mass of foliage. There are but few of the typical long tendrils or runners and these extend upward.

At this time the surface is a little more than half covered, and the vines are about one and one-half feet deep. A bunch or semi-bunch type; some dead leaves.

**Plot 8. Iron.**—A distinct light green color. Leaves are medium to large and oval in shape. The vines grow distinctly upright. There is an abundance of long tendrils that extend upward and outward, but do not creep on the ground. A distinctly semi-bunch, erect growing type.

At this time the surface is nearly covered and in many places the vines have intertwined between the rows. Vines are thrifty and vigorous. Not suffering from drouth. About two and one-half feet high. No blossoms.

**Plot 9. California Blackeye.**—Very dark, glossy green foliage; leaves large, rather oval, with blunt tips. Numerous runners or tendrils, which extend in every direction, but mostly laterally; some creep upon the ground. This is a distinctly erect-growing type.

At this time the surface is about three-fourths covered, but the vines stand less than a foot and a half high. Very vigorous; no dead leaves. Some blossoms and many fruit stems.

**Plot 10. Mount Olive.**—Very light green in color. Leaves medium size, long and slender, generally pointed. An abundance of tendrils or creepers extending in all directions, but principally upward. A vining, but not a creeping variety.

The surface is about two-thirds covered and the vines are about one and one-half feet high. Blossoms are forming, but none open.

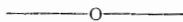
**Plot 11. New Era.**—Can detect no difference between Plot 11 and Plot 7. Both were seeded from the same seed.

**Plot 12. Taylor.**—Medium light green in color. An abundance of tendrils, but not the long, slender tendrils typical of the other vining varieties. Tendrils mostly upright—some lateral; a typical vining, but not a creeping variety. Surface three-fourths covered. Two feet or more in height; vines in good condition; many buds, but few blossoms.

**Plot 13. Cream.**—Only about three-fourths stand. All other varieties were practically perfect so far as stand is concerned. Medium dark green, small leaves, rather pointed, numerous long, slender tendrils growing upward and outward. Not very dense foliage. A distinct vining variety, but rather slow growing. Rather low and not spread out very much. About half the surface covered and about a foot or less in height. There are no blossoms at this time.

The remaining plots are all duplicated and do not differ so far as description is concerned from the ones already described.

Notes taken July 22, 1913. Two months after date of seeding.



## VARIETY COWPEAS

### Notes on Growing Condition, August 29, 1913

**Plot 1. Speckled Crowder.**—Fairly heavily fruited. Pods well filled. Peas rather small and shriveled. Leaves turning brown and suffering from drouth. Ready for first picking a week ago. No blossoms and no signs of continued growth.

**Plot 2. Whippoorwill.**—Has failed to produce seed. Only a few pods. Poorly filled and badly shriveled. Suffering from drouth about the same as the Speckled Crowder.

**Plot 3. Red Ripper.**—Very few pods, small and poorly filled. Suffering from drouth. Would still make good growth with favorable conditions.

**Plot 4. Red Ripper.**—Very few pods formed; fairly well filled. Not as vining as Plot 3. More erect. Suffering from drouth.

**Plot 5. Yellow Crowder.**—A few pods, but poorly filled and peas are shriveled. Not as heavily fruited as the Speckled Crowder, but a heavier growth of vines. Suffering from drouth.

**Plot 6. Lady.**—Failed to produce seed. Suffering from drouth.

**Plot 7. New Era.**—Failed to produce seed. No blossoms. Suffering more than any other from drouth. Vining habit. Upright growth.

**Plot 8. Iron.**—Very few pods. Well filled, but peas are small. No blossoms. Suffering from drouth; heavy growth of upright vines.

**Plot 9. California Blackeye.**—Heaviest fruited of all varieties. Pods poorly filled and peas are shriveled. Very small amount of vines. Ready to pick two weeks ago. Pods are popping open. More dead leaves and vines than any other variety.



Figure 3.—Field of Speckled Crowder Cowpeas, 1912

**Plot 10. Mount Olive.**—Very well fruited. Pods very well filled. Peas slightly shriveled. Fruited almost as heavily as the California Blackeye, and not so badly affected by drouth; with rain would still make some grain.

**Plot 11. New Era.**—An occasional pod, otherwise the same as duplicate plot of New Era.

**Plot 12. Taylor.**—Failed to produce seed. No blossoms; suffering badly from drouth. A vining variety, spreading out considerably on the ground.

**Plot 13. Cream.**—Fairly well fruited compared with other varieties this season; pods fairly well filled; peas are shriveled. Very few vines; matured ten days ago; an occasional blossom; not suffering from the drouth.

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### CULTURE AND IMPORTANCE

At this time cowpeas cannot be considered a staple farm crop in Oklahoma. They are used largely as a catch crop and on small areas where it is desired to improve the soil.

Cowpeas, however, will have to be given a more important place in Oklahoma agriculture. When the soil has been under cultivation a greater length of time it will be found necessary to do something to add organic matter and to improve its physical condition.

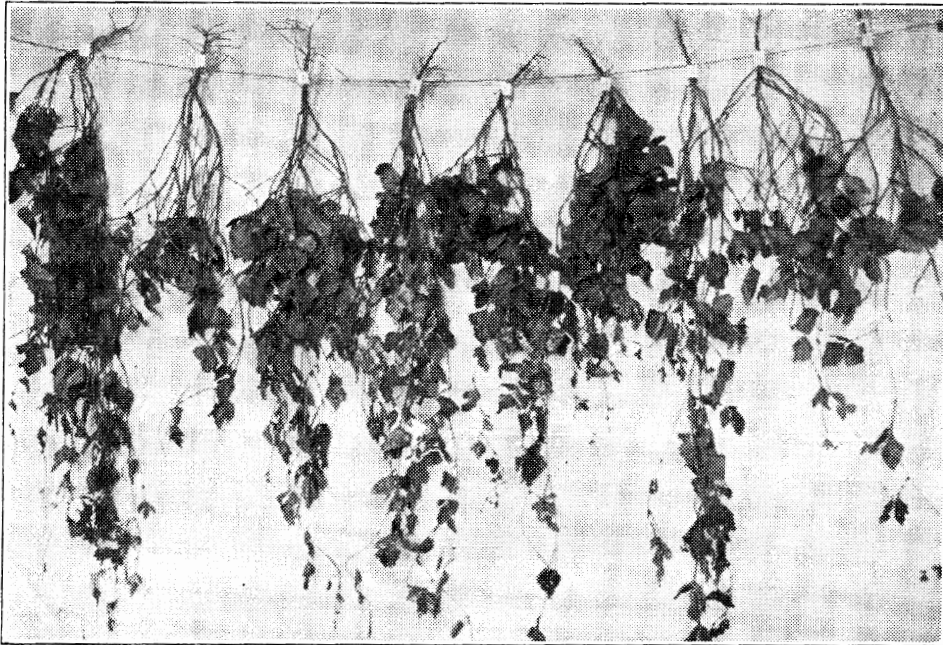
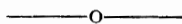


Figure 4.—Varieties of Cowpeas, 1912. From left to right these plants come in the regular order found in the table of Variety Tests for 1912, Plots 1 to 9, inclusive

The common hay plants used in the North and East are not suitable for the greater portion of Oklahoma. Cowpeas will be found to be one of the best substitutes for such crops. When better systems of farming are adopted and rotations are followed, cowpeas will undoubtedly have an important place on most farms in this State.



## CLIMATE

Cowpeas are a native of a semi-tropical country. In this country their greatest value is found in the Southern States. Their value decreases as they are grown farther north. They are, however, at this time being grown quite successfully as far north as Ohio, especially as a crop to improve the soil.

Cowpeas are suited to a great variation in climate. They will withstand quite a degree of drouth if properly tilled. Under very dry conditions they will produce a fair amount of hay, although under such conditions the production of seed will be very small.

Owing to the effect of climatic conditions the yield of cowpea grain is quite variable. It cannot be considered a sure crop for grain production. There will seldom be a year when forage production will not be good, but there will be many years when there is practically no grain production.

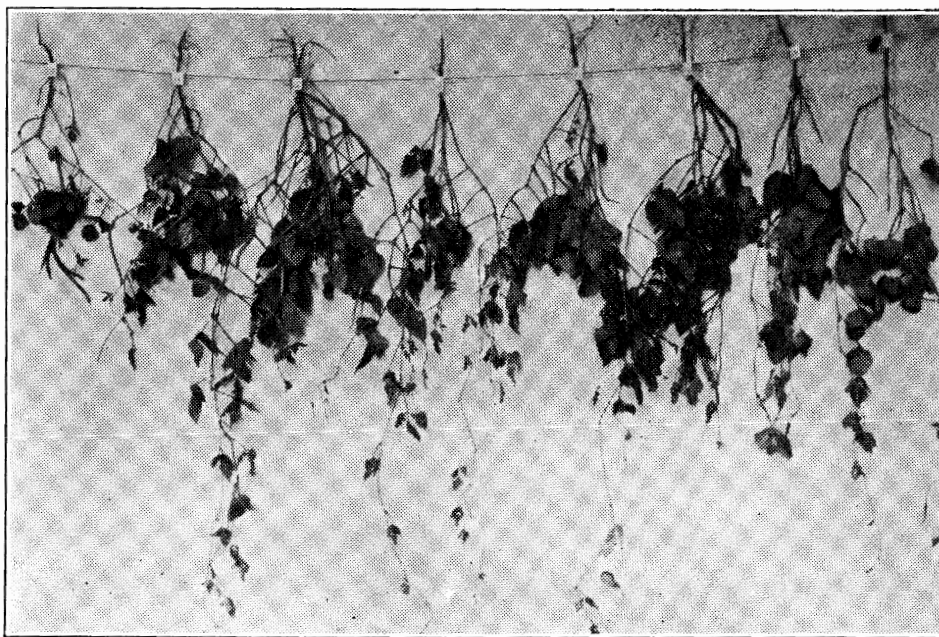
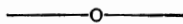


Figure 5.—Continuation of Varieties in 1912, Plots 10 to 17, inclusive. (See Figure 4)



## SOILS

Cowpeas may be grown in Oklahoma on practically any type of tillable soil. They do best on rich, sandy loams that are well supplied with lime and cannot be successfully grown on acid or sour soils.

### Preparation of the Soil

Cowpeas respond to good soil preparation. A good yield cannot be expected if careless methods of preparation are used. Deep fall and winter plowing should be practiced and the surface left rough until spring. On blow soils it is better to list than to plow. In the spring the land should be harrowed or disked, according to its texture and condition. Just before seeding the soil should be thoroughly pulverized by either harrowing or disking, or both.

### Rotations

The place cowpeas will occupy in the rotation depends upon whether the crop is to be plowed under for green manure or is to be harvested for grain and hay; whether it is to be planted as a catch crop after wheat or oats, or is to be planted in the spring as a regular crop; or whether the cowpeas are to be planted between the rows of corn or kafir, or rows of corn alternated with rows of cowpeas.

Cowpeas have been strongly recommended in Oklahoma as a cover crop to be drilled in immediately after oats or wheat have been harvested. Some farmers, especially in the eastern part of the State, have been able to successfully use them for this purpose, but in the central and western parts the growth obtained often fails to pay for the seed used. At the Experiment Station this method has been entirely discontinued.

In the eastern part of the State the method of drilling cowpeas between corn or kafir rows at the last cultivation may be advisable. We do not believe it advisable in other parts of the State.

Whether or not cowpeas and corn or kafir should be planted in alternate rows is debatable. From the standpoint of production for a given year our experiments clearly indicate that just as great a total yield will be procured if the two crops are planted on separate fields. From the standpoint of harvesting, it is never advisable to plant crops either mixed or in alternate rows. This is taking into consideration merely the yield and ease of harvesting. We consider it advisable to grow the crops in separate fields, to plant the kafir and corn thinner and to grow the cowpeas as a regular crop. This statement assumes that a rotation of crops will be practiced.

Planting kafir and cowpeas in alternate rows if the cowpeas are to be fed off in the field would seem to be all right. This would be particularly true if the kafir is to be hogged down. It will not increase the total yield unless in the ordinary system of planting too much seed is used per acre. The plan of alternating rows, however, is one which many farmers will follow when they will not follow a rotation of crops. This practice would seem to be not only feasible but advisable under such circumstances.

The question in this case is not merely the question of yield. It resolves itself into the question of whether or not cowpeas are to be grown at all. There are many objections to this crop. Under ordinary systems of farming, cowpeas are not apt to become a popular crop.

The planting of cowpeas and kafir in alternate rows may be considered in the light of a rotation. This is especially true if the rows are alternated from year to year, so that the kafir will be grown in the same row as the cowpeas every other year.

The following rotations, which can be adapted to the different sections of the State, are suggested:

No. 1	No. 3
First year, cotton	First year, cotton
Second year, cowpeas	Second year, cowpeas
Third year, kafir or corn	Third year, oats or wheat
No. 2	No. 4
First year, corn	First year, kafir
Second year, cowpeas	Second year, cowpeas
Third year, wheat or oats	Third year, wheat or oats

If the soil is to be increased in fertility by growing cowpeas, the crop must either be plowed under as a green manure or pastured off, and the manure thus produced plowed into the soil. On soils of average fertility, if cowpeas are harvested and both the hay and grain removed from the field, the soil will be left no richer in nitrogen, as the nitrogen stored in the roots

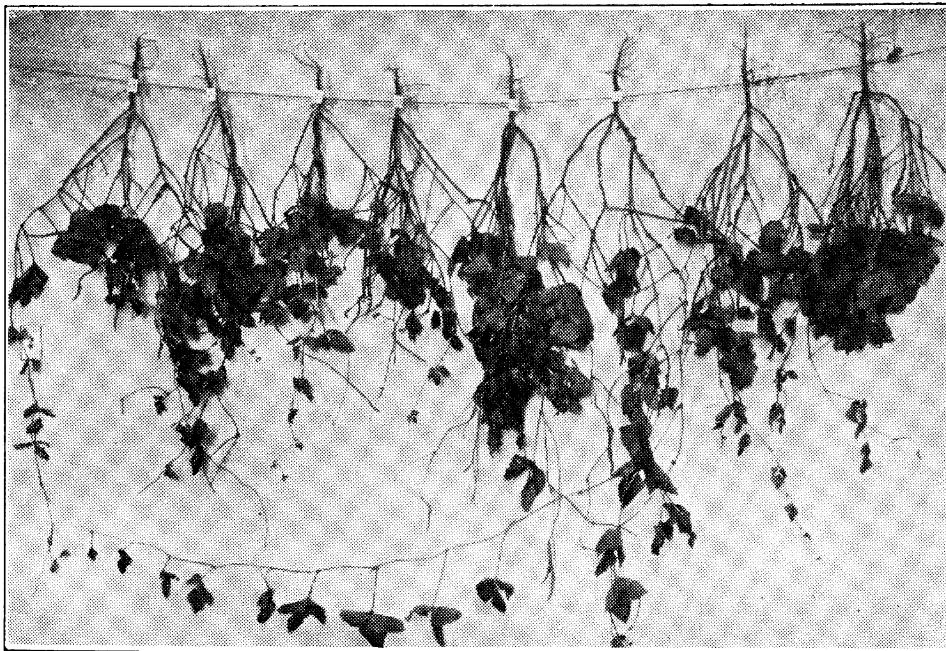


Figure 6.—Continuation of Varieties in 1912, Plots 18 to 25, inclusive. (See Figures 4 and 5)



and stubble is approximately the same as that taken from the soil by the growing plant.

### **Planting**

**Time.**—Cowpeas can be planted any time from the last of April until the middle of July. May is usually considered the best time.

**Amount of Seed and Distance Apart.**—When sown thick with a grain drill or sown broadcast a bushel of seed per acre is required. If planted in rows thirty-six to forty-two inches apart, from a peck to one-third of a bushel will be sufficient.

**Methods of Planting.**—When cowpeas are planted for grain production it will generally be found advisable to plant them in rows and cultivate the crop. Many different types of planters are suited for this purpose. Care should be taken to get plates having the right sized openings so that the planting will be at the desired rate and that the seeds will not be split.

**As a Catch Crop.**—When ground is prepared immediately after a crop of wheat or oats is removed and planted to cowpeas the results will be quite satisfactory in favorable seasons. Cowpeas may also be planted in corn or kafir at the last cultivation.

Very seldom under these conditions will the cowpeas produce any grain. However, for pasture or green manure, this practice may be worth while. Much depends upon the rainfall.

### **Cultivation**

The first cultivation for cowpeas must be shallow in order to prevent covering the plants. Harrowing just before the plants are up is a good practice, but unless they are planted in a lister furrow this method cannot be followed after the plants are above the ground. Cowpeas should be given frequent and thorough cultivation until the vines have made such growth that cultivation can no longer be done without injuring them.

### **Breeding and Selection of Seed**

Not much work has been done to improve the cowpea. New varieties, however, are being introduced from time to time, but these have generally been considered accidental rather than the results of systematic work.

There are certain valuable characteristics. Among these are: The size and vigor of the vines, habit, prolificness, disease resistance, weevil resistance of seed, retention of leaves late in the season, evenness of maturity, and time of maturity.

If any or all of these characteristics could be improved, cowpeas would be found to be a more valuable crop.

### **Harvesting**

The method to be used in harvesting cowpeas will depend upon whether they are grown for hay or grain.

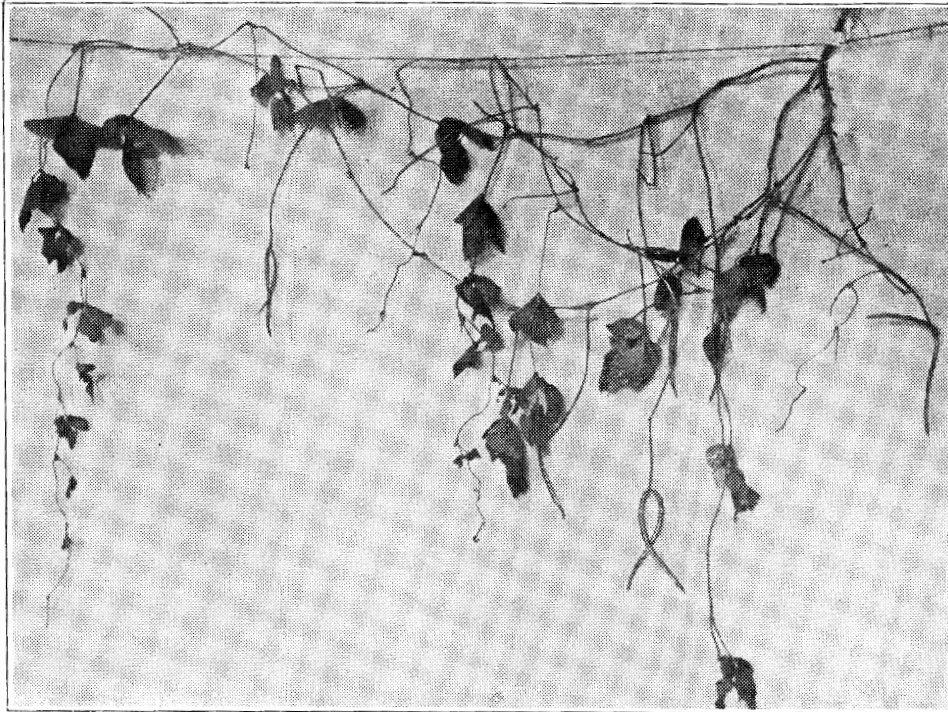


Figure 7.—A single plant of New Era Cowpeas, vining habit. Length 11 feet, 6 inches

**Harvesting for Hay.**—Where cowpeas are grown for hay only they should be harvested when the first pods turn yellow. The great difficulty met with in harvesting cowpeas is due to the tendency which the peas have of intercrossing and vining to such an extent that they will not separate into swaths, but become entwined and wound about the machine. The type of machine which can best cope with this difficulty is the one most desirable.

The common mowing machine is used almost entirely on the Experiment Station farm. In those seasons when the vines are unusually long and heavy, a rolling coulter is attached to the end of the sicklebar and men with forks follow the mower, removing the cut vines to the side.

The mowing machine with buncher attachment has met with favor wherever used.

**Curing for Hay.**—Cowpeas are very difficult to cure due to the large stems and the thick, large leaves. The vines should be raked into swaths and allowed to remain in this condition for several hours. The vines should then be stacked in small piles or cocks and allowed to remain in the field for from two to five days, depending upon conditions. The hay can then be stored in the haymow or stacked. The stacks should be topped out or covered with such material as prairie grass, slough grass and the like.

**Harvesting for Seed.**—In harvesting cowpeas for seed the vines should be allowed to mature considerably longer in the field than when harvested for hay. Harvest the peas when at least half the pods are ripe, and although

some loss will occur as a result of the overripe pods bursting and shattering the peas, this loss will be less than if the peas were harvested earlier, or before many of the pods are ripe.

**Methods of Harvesting for Seed.**—The methods of harvesting for seed will differ materially from those followed in harvesting for hay. Where but a small area is grown the most practical method is that of handpicking. In this way the peas can be gathered as the pods ripen. Go over the field as many times as desired. The cost of harvesting peas by this method ranges from 75 cents to \$1.00 per bushel.

When a larger acreage is grown the peas can be harvested by one of the methods suggested under harvesting for hay and threshed by a power thresher. There are several patented pickers on the market, but up to the present time their success would not warrant their use by the average grower.

**Green Manure.**—When cowpeas are to be used for green manuring, the crop should be plowed under while the vines are still green.

**Pasture.**—Cowpeas make a good pasture crop. Care must be exercised when cows or sheep are turned into such pasture. Pasturing during the early season and then plowing down the residue is a good practice.

Cattle and sheep are liable to be affected by bloat when pastured on any legume. This is particularly true if they are first turned on when the vines are wet from rain or dew. If the peas are fairly ripe there will be little or no danger.

### Threshing

The leading methods of threshing cowpeas may be enumerated as follows: By flailing, hulling, and power threshing.

When only a few peas are gathered for seed, flailing is recommended. Where a considerable quantity of cowpeas are grown for seed, and where the pods are gathered, it is advisable to secure a huller.

A huller can be secured at a price ranging from \$20.00 to \$35.00. Power threshers which do satisfactory work can be purchased. The cost of these machines, exclusive of the engine, is from \$300.00 to \$600.00. This puts them entirely out of reach of the average grower, and the purchase of such a machine would be justified only in a vicinity where a great number of acres are devoted to the growing of cowpeas.

A common thresher or grain separator can be used to thresh cowpeas by reducing the speed of the cylinder to from 300 to 450 revolutions per minute. Usually a thresher cracks too many seeds and cannot be used when the peas are to be used for seed purposes. This practice is entirely satisfactory when the grain is used for feed. However, there are one or two machines on the market which will successfully thresh cowpeas.

Cowpeas are not difficult to store in order to keep the grain in good condition. It is, of course, necessary to protect the seed from the rain, rodents and weevils.



Figure 8.—Picking Cowpea Seed

### Care and Storage

Some claim that weevils will not affect the seed stored in the pods. In our experience we have not found such to be the case. The damage from weevil seems to be about as great to the peas in the pod as in the threshed grain.

When the grain is to be used for seed purposes it is absolutely necessary to give protection from weevil. This point will be discussed under the heading of "Insect Enemies".

If the grain is stored in a dry condition there should be no difficulty in keeping it in good shape for seed purposes, providing protection is given from weevil.

## COMPOSITION AND FEEDING VALUE

Cowpeas make excellent feed for all livestock. The forage and grain are very rich in protein. The composition of cowpeas when made into silage and the composition of the hay and grain is given in the following table, taken from Ohio Bulletin No. 237:

### Total Nutrients in 100 Pounds

	Water	Ash.	Protein.	Fiber.	N. F. Ex.	Fat.
Cowpea silage .....	79.3	2.9	2.7	6.0	7.6	1.5
Cowpea hay .....	10.5	14.2	8.9	21.2	42.6	2.6
Cowpea grain .....	14.6	3.2	20.5	3.9	56.3	1.5

### Digestible Nutrients in 100 Pounds

	Protein.	Carbo- hydrates.	Fat.	Nutritive Ratio.
Cowpea silage .....	1.5	8.6	.9	1:7.2
Cowpea hay .....	5.8	39.3	1.3	1:7.3
Cowpea grain .....	16.8	54.9	1.1	1:3.4

### Fertilizing elements in 100 Pounds

	Nitrogen.	Phosphoric Acid.	Potash.
Cowpea hay .....	1.43	.15	.46
Cowpea silage .....	.43	.52	1.47
Cowpea grain .....	3.28	1.01	1.20

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## INSECT ENEMIES

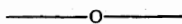
The cowpea weevil causes great damage to the seed and will destroy an entire lot in a very short time if not prevented. The common opinion that peas, when stored in the pod, will not be injured by the weevil is erroneous. To destroy weevil either carbon bisulfide or hydrocyanic acid gas can be used.

The seed should be placed in practically air tight boxes or bins and uncovered dishes filled with carbon bisulfide placed on top of the seed and left until it evaporates. The gas formed is heavier than air and will settle down through the peas. Sprinkling the surface layer with this insecticide may also be practiced.

In using these methods it must be remembered that the adults and larvae only are destroyed and the eggs are not injured. Therefore, in order to completely rid the peas of the weevil, it is necessary to repeat the treatment several times. The treatment should be given frequently enough so that the young insects will be killed shortly after the eggs hatch.

## DISEASES

There are practically no diseases injurious to cowpeas in Oklahoma at this time. In several of the Southern States cowpea wilt is quite common and is very destructive. When this disease is present it is advisable to grow Iron cowpeas. This variety is quite resistant to wilt.



## SUMMARY

We consider the Speckled Crowder, Whippoorwill and the New Era varieties the best for general purposes in Oklahoma.

The variety should be selected according to the purpose for which it is to be used.

Cowpeas deserve a wider cultivation in Oklahoma. They can be used for a variety of purposes. They will some day undoubtedly take a very important place in the cropping systems in this State.

Protection must be given the seed from weevils. One of the simplest and easiest methods is to treat with carbon bisulfide. If the treatment is given too strongly it lowers the germination of the seed.

Cowpeas are not affected by chinchbugs and have practically no insect enemies, and are almost free from plant diseases in Oklahoma.

Cowpeas will grow on almost any type of soil and, being a legume, are valuable for soil improvement when plowed under by both increasing the nitrogen content of the soil and by adding organic matter.



