

# CROP ROTATIONS

## FOR

### PIEDMONT NORTH CAROLINA

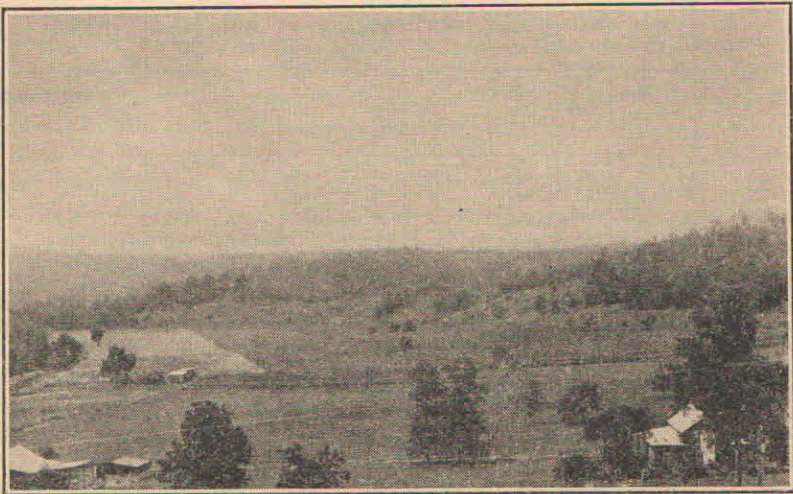


FIGURE 1—A three-year crop rotation of corn, soybeans, and wheat in Surry County.

NORTH CAROLINA STATE COLLEGE OF AGRICULTURE AND ENGINEERING

AND

U. S. DEPARTMENT OF AGRICULTURE, CO-OPERATING

N. C. AGRICULTURAL EXTENSION SERVICE

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## CROP ROTATIONS FOR PIEDMONT NORTH CAROLINA

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During the past several years many farms in the Piedmont section have been greatly improved by the use of well planned crop rotations, where the crops follow each other in regular order, as opposed to the usual practice of planting crops without a definite system. There is also an abundance of experimental proof that such conditions as soil, season, fertilization, and cultivation being equal, better yields can be obtained with a good crop rotation than with a poor crop rotation, or with the continuous growing of a single crop.

### ADVANTAGES OF A CROP ROTATION

Some of the advantages of a good crop rotation are:

(1) More crops will be turned under for green manure. This means the soil will contain more organic matter. The organic matter will make more moisture available to crops in dry years, will help get rid of excess moisture in wet years, will check erosion of hilly and sloping lands, and will make all lands easier to till.

(2) If the crop turned under be a legume, it will add to the soil large quantities of nitrogen from the air. This nitrogen will be available to crops following the legume. Less commercial nitrogen will have to be bought, so that the fertilizer bill can be considerably reduced.

(3) Plant food in the soil can be handled to better advantage. A good supply of organic matter in the soil increases the effect of commercial fertilizers upon growing crops. Since all crops do not draw on the different sorts of plant food in the same proportion, a crop that is a heavy feeder on one kind can, and should be, followed by one that feeds lightly on that kind of plant food. Corn, a heavy feeder on soil nitrogen, may well be followed by soybeans, which gets most of its nitrogen from the air. By alternating deep-rooted and shallow-rooted plants, plant food may be taken from different depths in the soil. Much plant food that is out of reach of a shallow-rooted crop like wheat or oats, is available to red clover, which roots deeply.

(4) Where lime is used it can be applied at the point in the rotation where it will do the greatest good to the crop that needs it most. Then there will be enough lime left for the other crops. This also holds true of stable manure.

(5) Weeds are kept under better control. Some weeds are worse in cultivated crops, others in broadcast or sod crops. By alternating these classes of crops all weeds are more easily managed.

(6) Many plant diseases and harmful insects will be controlled. While this does not apply to all pests, the practice of crop rotation is well worthwhile from the standpoint of disease and insect control alone.

(7) It is much easier to practice diversification of crops with a rotation than without one.

**TABLE 1**  
**GRAIN YIELDS ON THE ALEXANDER COUNTY HOME FARM, TAYLORSVILLE,  
N. C., UNDER A THREE-YEAR ROTATION WITH LEGUMES**

Year	Corn			Wheat or Rye			Soybeans or Lespedeza		
	Field No.	Acres	Bushels an Acre	Field No.	Acres	Bushels an Acre	Field No.	Acres	Yield
1924.....	3	12	83½	1	10½*	130	2	12	Mostly turned under
1925.....	2	12	200	3	12 †	108	1	10½	" " "
1926.....	1	10½	335	2	12 ‡	177	3	12	" " "
1927.....	3	12	500	1	10½ §	85	2	12	" " "
1928.....	2	12	643	3	12 §	160	1	10½	" " "
1929.....	1	10½	608	2	12 §	224	3	12	" " "

\* Wheat, 79 bu. Rye, 51 bu.

† Wheat, 81 bu. Rye, 27 bu.

‡ Wheat, 147 bu. Rye, 30 bu.

§ All wheat.

Note:—The three year rotation on this farm was:

First year—Corn and soybeans.

Second year—Wheat or rye followed by soybeans or lespedeza.

Third year—Soybeans or lespedeza.

The soybeans planted with corn furnished seed for the farm. Most of the soybeans and lespedeza following small grain were turned under, only about five acres being cut for hay each year. The average acre fertilizer application was, for corn 200 lbs. 11-6½-2, for small grain 200 lbs. of 10½-3½-3½, and for soybeans 200 lbs. 12-1-1.



(8) With a variety of crops, labor is more evenly distributed through the year. Some fields are plowed in spring, others in the fall or winter. Different crops are planted and harvested at different times. All this will enable one man to handle more acres than where most of the farm is planted to a single crop.

(9) The general management of the farm is made easier. The small fields and patches seen on many farms can be consolidated into large fields. This will make all field work easier. The land is kept at work nearly all the time, instead of being allowed to loaf half the year. Loafing land represents a big investment that is bringing no returns. The farmer knows well in advance what crops he is going to plant, and where. He also knows his seed and fertilizer requirements ahead of time. He can make his plans accordingly, and usually gets his crops planted on time.

(10) Lastly, soil fertility can be kept up under a tenant system of farming. Most tenants will naturally neglect soil improvement if left alone. But if they are required to follow the right sort of rotation the soil will be built up.

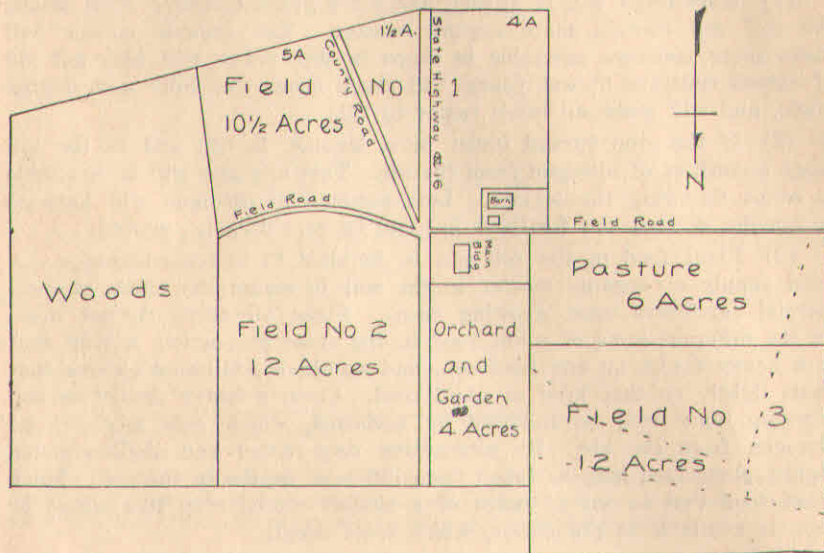


FIGURE 2—Farm of the Alexander County Home, Taylorsville, N. C.

A small farm arranged for a three-year rotation. Field No. 1 is composed of three small fields, separated by roads. It is sometimes necessary to use two or more small fields that do not join for one of the main fields. The dotted lines on Field No. 3 show how this field was divided before the rotation was started.

### REQUIREMENTS THAT A GOOD CROP ROTATION MUST MEET

(1) A good rotation must take care of and improve the soil. If it fails to do this it fails to meet the chief requirement of successful farming.

(2) It must produce enough corn and roughage for the livestock on the farm and such other food and feedstuffs as can be grown economically.

(3) The acreage left after satisfying the two above requirements is to be planted to one or more money crops (preferably more than one).

(4) The rotation must be so planned that there is some return from each acre every year in the form of feed or money crops, in addition to the green manure crops.

(5) Only crops that are adapted to the soil and climate should be included in the rotation.

(6) The order of crops must so be arranged that there will be plenty of time to harvest each crop before the time for planting the crop which is to follow it.

(7) The acreage and proportion of different crops must be so adjusted that the labor available can handle them.

(8) In the Piedmont section where much of the land is rolling, a large part of the rotation should consist of broadcast crops, such as small grains, and sod crops, such as red clover and lespedeza. These will help to reduce erosion. Cultivated crops should also be included, not only because of their economic importance, but also because of their value in weed control.

TABLE 2  
SCHEDULE OF CROPS FOR ALEXANDER COUNTY HOME FARM,  
TAYLORSVILLE, N. C.

Year	Field No. 1 (10½ Acres)	Field No. 2 (12 Acres)	Field No. 3 (12 Acres)
1924	Wheat or Rye Lespedeza or soybeans	Soybeans (Hay and Seed)	Corn and Soybeans Wheat or Rye
1925	Lespedeza or soybeans	Corn and soybeans Wheat or rye	Wheat or rye Lespedeza or soybeans
1926	Corn and soybeans Wheat	Wheat or rye Lespedeza or soybeans	Lespedeza or Soybeans
1927	Wheat Lespedeza or soybeans	Lespedeza or Soybeans	Corn and soybeans Wheat
1928	Lespedeza or Soybeans	Corn and soybeans Wheat	Wheat Lespedeza
1929	Corn and soybeans	Wheat Lespedeza or soybeans	Lespedeza

In this rotation soybeans are planted with corn for seed and turning under. A crop of small grain is sown each fall after the corn and soybeans. Lespedeza is sown on half of the small grain, and the rest followed by soybeans for hay or turning under.

Since 1929 this has been changed to a four-year rotation, another field having been cleared.

### HOW TO PLAN A ROTATION

When a rotation is once established it is easier to follow it than not to. The chief difficulty is in getting started. It sometimes looks like a hopeless undertaking to try to bring order out of the chaos prevailing



on a farm; where there are a dozen or more small patches instead of a few fields, and three or four separate patches of every crop. However, a little planning will quickly put such farms into shape to follow the rotation. The first thing to do is to make a rough map of the farm, showing each field, its acreage, and the crop growing on it. This map will usually show that, besides having too many fields, the farm has too many acres of corn, cotton, tobacco, or wheat, and far too few of legumes. A study of the map will enable one to combine the small fields into three, four or more large fields, all about the same size. On some farms it will be necessary to let two small fields serve as one of the main fields, even though they do not join. Then select a rotation that meets the requirements given above, and which is of the same general type of farming as is already being practiced. The number of years in the rotation must be the same as the number of fields. In some cases the rotation may have to be modified to fit the number of fields, in others the number of fields can be adjusted to the rotation.

Sometimes it is advisable to have two independent rotations on the same farm. This is often the case on tobacco farms. The land not growing tobacco can then be built up to a high state of fertility, while high quality tobacco is being produced on other fields, in a rotation designed to keep the soil from becoming too rich. On still other farms there are two types of soil so widely different (such as bottom lands and uplands) that a separate rotation is needed for each type of soil.

The next step is to shift from the present layout of crops to the new rotation. This may take two or three years. Make a schedule for each part of every field, from the present time until the rotation is firmly established. Having established the rotation, stick to it. Do not break it up just to take a chance on some crop that was high in price the previous year. Most of the rotations recommended in this circular

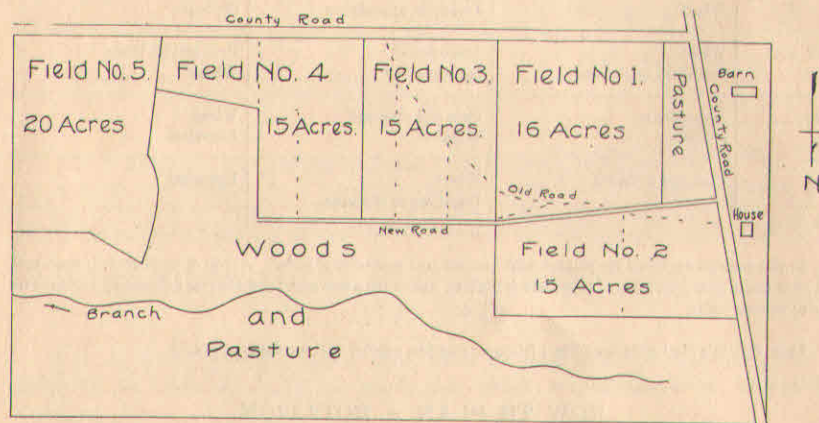


FIGURE 3—Farm of R. F. Shaw, Greensboro, N. C., Route 5, Guilford County.

A farm arranged for a five-year rotation. Note how Fields Nos. 2, 3 and 4 were formerly cut up into small patches. The old road running through the farm made a good layout of fields impossible, consequently it was replaced by a new one.

allow enough leeway in this respect. If a crop fails, plant some substitute crop, and get the field back to its regular schedule as soon as possible. For instance, soybeans or cowpeas may be used as a substitute when the stand of clover is not worth leaving.

### SAVING LEGUME AND COVER CROP SEED AT HOME

The expense of soil improvement crops can be greatly reduced by arranging to save seed of clovers, vetch, lespedeza, rye, oats, soybeans, cowpeas, and possibly velvet beans at home. An acre or two of these crops, if allowed to mature, will make more than enough seed for the

TABLE 3  
SCHEDULE OF CROPS FOR R. F. SHAW'S FARM, GREENSBORO, N. C.,  
GUILFORD COUNTY

Year	Field 1 (16 Acres)	Field 2 (15 Acres)	Field 3 (15 Acres)	Field 4 (15 Acres)	Field 5 (20 Acres)
1925.....	Wheat	Corn	a. Wheat b. Cowpeas c. Corn d. Clover e. Corn	a. Clover b. Tobacco c. Grass d. Corn	Miscellaneous Crops
1926.....	Soybeans Wheat	Wheat Clover and grass	Corn and Soybeans	a. Clover b. Wheat c. Grass d. Soybeans	Corn Rye and vetch
1927.....	Wheat Clover and grass	Clover and grass	Soybeans	Corn Rye and vetch	Soybeans Wheat
1928.....	Clover and grass	Corn and soybeans	Soybeans	Soybeans Wheat	Wheat Clover and grass
1929.....	Clover and grass	Soybeans Wheat	Corn and soybeans	Wheat Clover and grass	Clover and grass
1930.....	Corn and soybeans	Wheat Clover and grass	Soybeans Wheat	Clover and grass	Clover and grass
1931.....	Soybeans Wheat	Clover and grass	Wheat Clover and grass	Clover and grass	Corn and soybeans
1932.....	Wheat Clover and grass	Clover and grass	Clover and grass	Corn and soybeans	Soybeans Wheat
1933.....	Clover and grass	Corn and soybeans	Clover and grass	Soybeans Wheat	Wheat Clover and grass
1934.....	Clover and grass	Soybeans Wheat	Corn and soybeans	Wheat Clover and grass	Clover and grass

This dairy farm rotation was started in the fall of 1925, but was not completely established until 1929. The above schedule shows how this was done without any abrupt changes. Since the rotation was started, the cattle feeding capacity of the farm has trebled. The rotation consists of: 1. Corn with soybeans for turning under; 2. Soybeans for hay; 3. Wheat followed by clover and grass; 4. Red clover, lespedeza, orchard grass and reedtop for hay; 5. Clover and grass for pasture, residue turned under.



average farm. Cutting and threshing is a good method for clovers, vetch, Korean lespedeza, rye, oats, and soybeans; handpicking for cowpeas, and velvet beans; a seed pan for lespedeza; and the soybean harvester for soybeans.

On pages 8 and 9 are given some rotations suitable for the Piedmont section. Most of these rotations are in actual use in North Carolina. It should be remembered that these rotations can be modified, or other rotations planned, to suit special needs. Pages 6, 7 and 10 show how rotations are actually being carried out on some Piedmont farms.

### ROTATIONS FOR THE PIEDMONT

#### *For General or Livestock Farms:*

##### 1. (4 years)

- First year Corn (for grain or silage) with soybeans (for seed and turning under).
- Second year Soybeans (for hay), wheat or other small grain in fall (for grain or hay).
- Third year Wheat or other small grain (for grain or hay), red clover, sweet clover, or lespedeza drilled on grain in March.
- Fourth year Red clover, sweet clover, lespedeza (for hay, grazing and turning under).

A part of the corn land may be planted to cotton if desired.

##### 2. (5 years)

- First year Corn (for grain) with soybeans (for seed and turning under).
- Second year Corn (for grain or silage), or cotton.
- Third year Soybeans (for hay), wheat or other small grain in fall.
- Fourth year Wheat or other small grain (for grain or hay). Red clover, sweet clover or lespedeza drilled on grain in March.
- Fifth year Red clover, sweet clover, lespedeza (for hay, grazing and turning under).

##### 3. (5 years)

- First year Corn (for grain or silage) with soybeans (for seed and turning under).
- Second year Soybeans (for hay). Wheat or other small grain in fall.
- Third year Wheat or other small grain (for grain or hay). Red clover, sweet clover, lespedeza, and grasses drilled on grain in March.
- Fourth year Clover and grass mixture (for hay and grazing).
- Fifth year Clover and grass mixture (for grazing and turning under).

##### 4. (4 years)

- First year Cotton, vetch, or crimson clover in fall (for turning under).
- Second year Corn (for grain) with soybeans (for seed and turning under), or soybeans alone (for hay), wheat or other small grain in fall.
- Third year Wheat or other small grain (for grain or hay), lespedeza drilled on grain in March.
- Fourth year Wheat or other small grain (for grain or hay), lespedeza (for hay and turning under).

NOTE: The cotton may be omitted, leaving a three-year rotation.

##### 5. (3 years)

- First year Corn (for grain) and soybeans (for seed and turning under), or soybeans alone (for hay). Wheat or other small grain in fall.
- Second year Wheat or other small grain (for grain), lespedeza or red clover drilled on grain in March.
- Third year Lespedeza or red clover (for hay and turning under).

#### *For Cotton Farms:*

##### 6. (3 years)

- First year Corn (for grain) with soybeans (for seed, grazing and turning under).
- Second year Cotton.
- Third year Cotton.

In connection with this rotation, corn, oats and soybeans may be grown on lands unsuitable for cotton.

##### 7. (4 years)

- First year Corn (for grain) and soybeans (for seed, grazing and turning under). Oats, barley and vetch in fall.
- Second year Oats or barley and vetch (for hay), soybeans (for hay), or lespedeza (for grazing and turning under).
- Third year Cotton.
- Fourth year Cotton, vetch or crimson clover in fall (for turning under).

If desired, one year of cotton may be omitted, leaving a three-year rotation.

*For Tobacco Farms:*

## 8. (2 years)

First year Tobacco, abruzzi rye in fall.

Second year Abruzzi rye (for grain).

## 9. (3 years)

First year Tobacco, crimson clover or vetch in fall (for turning under).

Second year Corn (for grain). Wheat, oats or abruzzi rye in fall.

Third year Wheat, oats, or abruzzi rye (for grain). Abruzzi rye in fall (for turning under).

## 10. (4 years)

First year Tobacco, abruzzi rye in fall (for turning under).

Second year Tobacco, redtop and other grasses in fall.

Third year Redtop, etc. (for pasture).

Fourth year Redtop, etc. (for pasture).

NOTE: Rotations 8, 9, and 10 are to be used in connection with rotations 1 to 5.