Some Guides to Cropping Systems in North Carolina

North Carolina Agricultural Experiment Station
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Contents

The purpose of this bulletin is for use as a handbook in preparing cropping systems.

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SOME GUIDES TO CROPPING SYSTEMS IN N. C.

PART I

Introduction

Good farm management is essential for efficient production. The sequence of cropping is very important in good farm management. There are many factors which must be considered in outlining a satisfactory cropping system for a given farm.

First of all, the interests of the farmer must be considered. He may be a livestock farmer with either dairy herds or meat animals. Other farmers may be interested principally in cash crop production - cotton, tobacco, or similar crops. Still others may emphasize the cultivation of vegetable crops or fruits. Farmers of these various types will be confronted with a great diversity of problems, but most of the problems encountered may be grouped into three categories:

1. Climate: Temperature, precipitation, wind.
2. Soil: Fertility, acidity or alkalinity, physical condition, depth, slope, texture, erosion, etc.
3. Crop: Cultural practices, including harvesting and marketing, insect and disease control, and economic returns.

Although it is difficult to outline any one cropping sequence that must be followed under a given set of conditions, it would seem desirable to present those principles which should influence the choice of a cropping system. It is the purpose of this guide to list the factors involved and to state certain basic principles which may be used in the selection of a cropping system.

The phrase "cropping system" is used instead of "crop rotation" in this guide. A rotation implies an inflexible cycle or a fixed series of crops. Conditions such as a late freeze, or a hail storm may occur which necessitate a sudden change in crops grown. A cropping system must be sufficiently flexible to permit shifting of crops without sacrificing the benefits derived from the system followed. The major factors which a good cropping system includes are as follows:

1. It must be profitable. The maximum net return should be obtained for the employment of the farm family's labor and other resources over a period of years.

2. It must maintain the soil productivity at a reasonably high level; keep a desirable microbiological balance; and utilize the fertility to the highest degree of efficiency.

3. It must help control weeds, insects, and plant diseases.

4. It must maintain the soil in good physical condition to insure good infiltration of moisture and maintain proper air-water-root relationships necessary for sustained high production.

5. It must adequately control both wind and water erosion.

6. It must be flexible.

In considering the factors listed above it should be emphasized that any cropping system must be practical and relatively easy to follow. It becomes apparent that a good cropping system should include both row crops and sod crops. This is especially true in the control of weeds, insects, diseases, and erosion, and in the maintenance of the soil in good tilth. In developing a cropping system for a given farm all of the factors may not be involved and they may assume different degrees of importance for different situations. Moreover, in some instances certain factors may not be compatible. It is the purpose of this guide (1) to outline basic principles relative to the factors presented above, and (2) to present some recommended cropping systems for some of the different land capability groupings of soils in the major physiographic areas in North Carolina.

PART II

Some Basic Guides

Soil Fertility

1. Most soils in North Carolina (except peat or muck soils along the coast) contain less than three per cent organic matter. In fact, many of the cultivated soils, especially in the Coastal Plain, contain less than 1.5 per cent organic matter. One per cent organic matter is equivalent to approximately 1000 pounds of total nitrogen per acre per six inches of soil.

2. It is difficult to maintain the organic matter content of cultivated soils at the same level as virgin soils. Cultivation causes the organic matter content to decrease. This is partly due to loss of topsoil by erosion but, to a greater extent, to increased activity of the microorganisms within the soil.

Green manure crops usually do not add more than 1000 to 3000 pounds of dry matter per acre (25 to 50 green manure crops would be required to equal two per cent organic matter in soils).

3. Nitrogen for plant growth is released from organic matter through decomposition. The rate of decomposition of crop residue or other organic material is dependent upon temperature, moisture, aeration, acidity, and availability of nutrient elements, especially nitrogen. The greatest nitrate production (available nitrogen) takes place in warm (60° to 90°F.), moist (near field capacity) soils which are only slightly acid in reaction.

4. Young plants generally contain a higher percentage of protein (N) and lower percentage of fibrous material than mature plants. Decomposition and release of N for succeeding crops will be much more rapid if young, rather than mature, plants are plowed under.

5. For a greater residual effect, both in terms of fertility and soil structure improvement, plants should be permitted to approach maturity. A maximum quantity of organic residue, including both roots and tops, will be returned to the soil; and the decomposition rate will be slower.

6. Organic material plowed into the top 6 inches of soil decomposes more rapidly than when left on or near the surface of the ground. Plant residue on the surface will offer a greater protection against erosion and maintain a better rate of moisture infiltration than when plowed into the soil.

7. Properly inoculated legumes add nitrogen to the soil through nitrogen fixation in the nodules on the roots. As a general rule, biennial and perennial legumes such as clover and alfalfa fix more nitrogen from the atmosphere than annual legumes. The quantities fixed by the various legumes will be influenced by seasonal factors and soil conditions.

8. Soybeans, field beans, and field peas do not fix as much nitrogen as some other legumes and, when harvested for seed or hay, may not increase the nitrogen level of the soil materially. Under some circumstances they may be soil depleting.

9. In general, legumes do not take more than two-thirds of the nitrogen found in the plant from the atmosphere. The remainder comes from the soil. Cutting and removing the crop for hay will remove at least half of the total nitrogen in the plant (tops and roots) and leaves very little gain in the soil. Small grain plus lespedeza, where the lespedeza is cut for hay, may actually deplete the soil of nitrogen rather than increase it.

10. Grasses and grain crops in general (small grain, sorghum and corn) contain a relatively high percentage of nitrogen when young but at maturity are high in carbohydrates and low in nitrogen (a wide carbon-nitrogen ratio). This may result in slow decomposition and a temporary reduction in the available nitrogen level of the soil.

11. Ammonia when applied as a fertilizer does not move much in the soil. It will be converted to nitrate which does move with soil moisture. The rate of ammonia conversion is dependent upon moisture content and temperature. Although the rate of conversion is slower at low temperatures, it does take place. Under most conditions in North Carolina, ammonia should not be expected to remain as such for a period greater than six weeks.

12. No crop adds mineral nutrient elements such as phosphorus and potassium to the soil other than the small amount included in the seed. However, plants may alter the availability of the elements already present. Phosphates do not move appreciably in the soil and because of this may influence the fertilization of the crops grown in the cropping system for several seasons after application. Potassium, on the other hand, tends to undergo luxury consumption by plants (plants take in much more than needed for optimum growth), and may also be lost through leaching. Because of these factors, potassium should generally be applied to each crop in the sequence.

13. To obtain the most efficient results from fertilizers soils should be adequately limed. North Carolina soils generally are acid in reaction and much more lime is needed than is being used.

Soils (having a high cation exchange capacity) require more lime to overcome the acidity (change the pH) than sandy soils or those low in organic matter. The effect of the lime will last much longer on the finer textured soils. In general, the sandy soils will require a small amount of lime every three to five years. The finer textured soils, which require more lime per application, may not need liming again for a period of five to ten years. (Soil tests should be made from time to time to determine lime requirements.)

14. Legumes generally grow best on soils that are only slightly acid in reaction (pH 6.3 to 6.8). Peanuts and soybeans may require a slightly more acid condition due to manganese deficiency in some of the Coastal Plain soils.

15. It may be necessary to keep the soil acid for control of some plant diseases. For this reason little lime is recommended on fields where tobacco will be grown due to black root rot. Quite acid soils are needed to control scab on Irish potatoes.

16. Uneven distribution of lime or excessive application may result in an "overlimed" condition. Plants such as soybeans and peanuts may show nutrient deficiency symptoms.

17. Boron is needed on most North Carolina soils for alfalfa and sweet potatoes, and fertilizers for these crops should contain borax. (See fertilizer recommendation list for amounts.) Cabbage, cauliflower, and broccoli also respond to applications of boron. Other minor elements (copper, zinc, manganese, etc.) may be deficient in certain areas but their general use in fertilizer is not recommended at present.

Some crops are sensitive to boron applications and should not immediately follow crops treated with borax. These crops include cucumbers, melons in general, and snap beans.

18. A green manure crop is one used for increasing soil fertility (largely nitrogen and organic matter), whether turned under or left on the surface to decay, whether planted for that purpose or not, and irrespective of whether the crop is turned under while still green or after maturity. It may be legume or non-legume.

Green manure crops increase soil fertility by adding nitrogen such as fixation from the atmosphere by legumes and by reducing leaching losses. Nutrient elements subject to leaching may be absorbed by green manure crops and released the following season for the succeeding crop.

19. A cover crop is one used to cover the soil surface without reference to incorporation with it. If turned under it

ceases to function as a cover crop. It is planted for the purpose of protecting the surface against erosion and to maintain the immediate surface in a good physical condition for entrance of water and air. A cover crop may be a green growing crop or a mature crop left on the surface.

Care must be exercised in planting either green manure or cover crops that they are not host plants for disease or insects. A good example is the increase of root knot nematodes with Austrian winter peas. The Austrian winter peas should not be planted with crops subject to nematode infestation.

Soil and Water Conservation

1. Soils hold or store a certain quantity of water per unit of volume. The amount held is largely dependent upon the texture and, to a lesser degree, on structure and organic matter content. Water available to plant use is that held in the soil above the permanent wilting point (constant) and below the field capacity (constant). Moisture below the permanent wilting point is held so tightly by the soil that it is unavailable to plants. The field capacity is the maximum moisture a soil will hold against the forces of gravity.

During rain or irrigation water moves downward only after each layer of soil is wetted to above field capacity. If the moisture content of the soil is below field capacity, water moves largely in vapor form (except removal by plant roots). Moisture above the field capacity will move in the liquid form until the field capacity constant is reached. Once a given depth of soil has been wetted to the field capacity, application of more water will result in this water passing deeper into the soil profile until a drier region is reached. If a lower layer of soil is less pervious (more impermeable) than the layers above, the moisture content in the upper layer will increase above the field capacity, and runoff will result. If a drier region is not contacted, the surface water moves out in the form of ground water.

2. The amount of water that can be available in the soil for a given crop will depend on (1) the volume of soil occupied by the roots (horizontal distance and vertical distance or depth) and (2) the amount of available moisture the soil will hold per unit of volume. Most soils in North Carolina hold less than three inches of water per foot of depth. The sandy soils hold from one to one and a half inches of water per foot of depth and some hold less than this. The medium textured soils such as loams or silt loams usually hold from two to two and a half inches of available water per foot of depth.

A crop having roots extending two feet into the soil would have a maximum reservoir for available water of two to three inches in a sandy soil compared to a storage capacity of four to five inches on a loam or silt loam soil. The depth to which roots penetrate in the soil is very important in respect to the amount of moisture that is available.

3. The depth to which water will penetrate the soil is dependent upon (1) the capacity of the soil to hold available water (texture, structure, etc.), (2) the amount of water added, and (3) the moisture content of the soil at the beginning of wetting (rain or irrigation). Since sandy soils hold less water than clay soils, an inch of water will penetrate farther in the sandy soils.

4. Available water is lost from the soil through (1) evaporation from the surface (relatively rapid when soil is wet, humidity low, and temperature high, but moisture losses usually do not extend over a few inches in the soil unless it is cracked), and (2) transpiration by plants which accounts for greatest loss.

5. Sufficient vegetative ground cover should be provided to reduce erosion losses to an average for the rotation of not more than 3 to 5 tons per acre annually on deep soils. This cover may consist of growing plants or plant residues.

6. The need for cover increases proportionately with increased erosion hazards.

7. Vegetative cover is most needed on the land during the period when it is subject to the greatest amount of erosion.

8. Deep-rooted crops should be grown to maturity to increase permeability of heavy soils, thus improving water infiltration, internal drainage, and aeration.

9. Organic matter should be added in sufficient amounts to induce adequate infiltration and maintain desirable soil structure.

10. The type and amount of organic matter produced must meet the special needs of the land and the major crops grown in the rotation.

11. Maximum benefits to crops and soil should be provided by arranging the crops (including legumes and non-legumes, deep- and shallow-rooted varieties, and those which improve and conserve soil and save moisture) in proper sequence to meet the needs of the land conditions and farming system.

12. Crops in a sequence or system should be arranged in contour strips to reduce water erosion or in strips at right angles to the direction of prevailing winds to reduce wind erosion.

13. Maximum amounts of vegetative material should be kept on or near the surface to be most effective in controlling wind and water erosion.

14. The time and the method of land preparation in respect to crop residue largely determines the effectiveness of vegetative material in controlling erosion and influencing moisture conservation.

Disease Control

The effectiveness of cropping sequences in disease control depends upon many factors, but mainly upon the life history and behavior of the pathogen. There are four important considerations: (1) degree of host specificity, (2) rate of build-up of inoculum, (3) relative persistence of inoculum, and (4) means of dissemination.

1. Changes in crop sequence will have little control value with pathogens having a wide host range. Many of the seedling damping-off and root decay organisms fall into this category.

2. Pathogens which are wind-disseminated over wide areas are not appreciably affected by crop sequences. The rusts, downy mildews, and powdery mildews are examples of this type.

3. Many plant pathogens that attack the aerial parts of plants overwinter in crop refuse or in surface layers of soil. Most of them have a narrow host range and are disseminated chiefly by water. The use of a short rotation may be of great value controlling these diseases. Examples are: Ascochyta blight of cotton, various anthracnose diseases, and a large number of leaf spot diseases.

4. Many important plant pathogens in North Carolina are persistent soil inhabitors. They are capable of indefinite existence in the soil, even in the absence of suitable host plants. There are two main types:

(1) Those which persist by means of long-lived, resistant spores or resting bodies. Long periods between susceptible crops may reduce the inoculum level but will not eliminate it. Examples are: Fusarium wilts, tobacco black shank, cabbage club root, and certain smuts.

(2) Those which persist because they are well adjusted to the soil environment and can

live indefinitely in competition with other soil organisms. The sequence of crops generally is of little consequence in controlling these diseases. Examples are: Southern stem and root rot and soreshin and damping-off caused by such pathogens as Pythium and Rhizoctonia.

5. Certain pathogens are found in soil but they can develop and reproduce only in roots of suitable hosts. They are sometimes called root inhabitors. Cropping sequences involving non-host plants are useful in control. Various nematode diseases fall in this category.

Insect Control

A knowledge of the life history, behavior, and feeding habits of important insect pests is necessary in evaluating the potential benefits to be derived from control measures based upon cropping practice. In order for a certain cropping sequence to be of use in controlling insects, the following basic principles generally apply:

1. Insects feed on specific crops and cannot survive, or at least its numbers decrease, on certain crops.

2. The insect cannot move about extensively, at least in the destructive stages.

3. The insect has a relatively long life cycle, and its rate of reproduction is slow.

4. The insect does not attain maximum destructiveness in a single year but may even require a period of several years.

5. Crops can be changed when the insect is in a non-migratory stage.

6. Adults prefer certain situations for oviposition. Such situations can be avoided during egg-laying periods.

Economic Guides to Choices Among Cropping Systems

If choices of cropping systems are to be economically sound for the time period for which plans are being made, it is necessary to determine how much the change will increase or decrease (a) income and (b) expenses. Therefore, one must consider the effects of alternative cropping sequences on the following:

1. Changes made necessary in the employment of labor, power, machinery, and other factors used in production, and their effects on expenses.

2. The amount of income lost when output of some crops is reduced, and the amount of income added when production of some crops is increased. (Consider effects on acreage, quality, and yields of crops grown.)

3. Stability as well as size of net income. Diversification may either increase or decrease stability of income.

4. Costs of controlling erosion, diseases, soil fertility, etc., by means of cropping sequence compared with other means of control.

5. Flexibility of farming system; i.e., ability to make adjustments when crop failures or other emergencies occur. Crops which may be put to multiple uses are more flexible than one-use crops, and the longer the growing period of crops, the more inflexible the system.

Weed Control

It has been said that of the 1,200 weed species which trouble agriculture, all but 20 can be controlled by good crop sequence. For the purpose of controlling weeds, a good crop sequence will involve:

1. Summer row crops - tobacco, corn, cotton, peanuts, soybeans, etc.

2. Crops in which control methods are available for weeds such as morning glory, cocklebur, and pigweed.

3. The use of preemergence chemicals and good cultivation (grassy weeds).

4. Strong competitive winter grain crop with perennial grasses, drilled, which will crowd out most troublesome weeds.

5. Strong competitive crops and special crops as needed. Strong shade crops during the summer months, for 2 years, will crowd out Bermuda grass and nutsedge.

6. Overgrazing and periodic close mowing will control Johnson grass.

PART III

Major Considerations Which Apply to Important Crops

Lands planted to row crops generally are more subject to erosion than those planted to sod crops. Row crops are usually regarded as soil-depleting. In the major crops grown in North Carolina, certain specific problems are likely to be encountered. Some of these special problems are outlined below.

Flue-Cured Tobacco

1. Generally, do not follow a legume with tobacco except in the case of crotalaria on sands.

2. Grow on soils with pH below 6.2, generally.

3. Avoid soils containing more than 2.5 per cent organic matter.

4. Do not grow tobacco on same land continuously.

5. Do not alternate with the same crop in a continuous two-year rotation. (Example: corn and tobacco.)

6. Growing tobacco only once in three years will give better control of nematode than once in two years. Once in two years is better than continuous tobacco, providing the alternate crop is not the same over a period of years.

7. Avoid fine textured or poorly drained soils.

8. Crops to consider in rotation with tobacco for disease control. Crops indicated by a "yes" should be grown in 2- or 3-year rotations as a supplement to the use of resistant varieties. Susceptible crops are indicated by a "no".

Rotation Crops	Suitable for use on land affected by: Black shank	Granville wilt
Corn	yes	yes
Cotton	yes	yes
Cowpeas*	yes	yes
Crotalaria*	yes	yes
Fescue	yes	yes
Irish potato	no	no
Lespedeza*	yes	yes
Millet	yes	yes
Milo	yes	yes
Peanuts	yes	no
Pepper	no	no
Red Top	yes	yes
Small grains	yes	yes
Soybeans*	yes	yes
Sudan grass	yes	yes
Sweet potato	yes	yes
Weeds	yes	yes

* Grow 1 - 2 years in advance of tobacco

9. Rotation for nematode control in tobacco. There are three known groups of nematodes that attack tobacco and within certain groups there are species and strains which may differ in crop preference. For example, corn and cotton are considered excellent for root knot control but these crops are susceptible to certain species of the root knot nematodes which may build up if these crops are used too frequently. It is advisable to plan crop sequences in order to prevent the build up of any of these important nematodes.

Crops	Relative suitability of certain crops for controlling the following nematodes: Root knot	Meadow	Stunt
Corn	Excellent	Poor	Poor
Cotton	Excellent	Poor	Fair
Crab grass	Excellent	Poor	?
Crotalaria	Excellent	?	Excellent
Fescue	Excellent	Good	Fair
Lespedeza (Kobe, Korean, Sericea)	Poor	Good	Fair
Lespedeza (Rowan)*	Excellent	Good	Fair
Millet	Excellent	?	Fair
Milo	Excellent	Poor	Poor
Peanuts*	Excellent	Good	Excellent
Redtop	Excellent	?	?
Small grain	Excellent	Poor	Poor
Small grain (winter) & weeds	Good	Good	Good
Sudan grass	Excellent	?	Poor
Sweet potatoes	Poor	Excellent	Poor
Weeds	Good	Excellent	Excellent

* Rowan lespedeza and peanuts are susceptible to M. hapla species of the root knot nematode, which is most common in peanut growing areas.

10. Avoid growing sweet potatoes with tobacco in areas where fusarium wilt is a problem.

Cotton

1. Effective control of insects (boll weevil) is especially necessary when using nitrogen fertilizers as side dressing, or where cotton follows a good legume crop.

2. Cotton should not follow cotton because of ascochyta blight. Change in crops will control this blight.

3. Nematode damage may increase the incidence of fusarium wilt on resistant varieties of cotton. In planning the cropping sequence, nematode control must be considered.

Peanuts

1. Cropping sequence is important in controlling nematodes and in preventing the build up of southern stem and root rot.

2. Apply 400 lbs. of land plaster (gypsum) per acre unless the soil is quite high in calcium.

3. Manganese deficiency may occur on overlimed soils in the Coastal Plain.

Irish Potatoes

1. To control scab on Irish potatoes, grow them on fairly acid soils (below pH 5.5).

Corn

1. Greater damage from corn rootworms is likely under poor drainage, high pH, and high organic matter.

2. Wireworm damage is likely to occur on corn following lespedeza on high organic matter soils.

3. The critical period of nitrogen and moisture requirements on corn is during the tasseling period (approximately two weeks duration).

4. Corn has difficulty in getting sufficient phosphorus in early growth under cold conditions (below 65° F) and may show phosphorus deficiency symptoms. This condition is frequently overcome as soon as the soil warms up.

Small Grains

1. To increase yields, nitrogen should be applied before the grain reaches a height of about 6 to 8 inches. Late applications may increase the protein content of the grain but not the yield.

Sweet Potatoes

1. A 3- or 4-year interval between crops of sweet potatoes is essential in controlling scurf and black rot. It may be of limited value in controlling fusarium wilt, especially when small grains precede the potatoes.

2. In regions where fusarium wilt is a problem (Border Belt), sweet potatoes should not be grown in a cropping system with tobacco.

Forage Crops

1. The application of about 20 to 30 pounds of nitrogen is usually sufficient to establish stands of grass or grass and legume mixtures.

2. Both grass and legumes will consume more potash than actually needed for proper growth and it is necessary to top-dress with potash fertilizers each year.

3. Legumes should not follow legumes because of the likelihood of crown rot.

PART IV

Land Capability Groups by Major Problem Areas

One of the major factors affecting cropping sequences is the land condition. For this reason, lands in North Carolina have been grouped into land capability units for use and management recommendations.

The land capability classification provides a suitable means of interpreting land conditions in terms of use and management. All land in the state is placed in eight broad classes, according to the magnitude of the hazards and limitations of use.

Each of the classes may be divided into subclasses which indicate the kind of hazard: The letter "e" indicates that the chief problem of the subclass is erosion, "w" that the chief problem is water, and "s" that the chief problem is a soil condition of droughtiness and low fertility. Further subdivision into land capability units is made as necessary to provide groups of conditions for which practical recommendations can be made.

Land capability classes I, II, III, and IV include all the lands suitable for cultivation. Land capability classes V, VI, VII and VIII include the lands not suitable for continuous cultivation but suitable for grazing, woodland, or wildlife uses. In this guide land capability groups and cropping sequences are given only for the lands recommended for cultivation.

The major land capability classes, subclasses, and units by major problem areas are:

Coastal Plain

Land Capability Class and Subclass	
I.	Well drained, productive soils, easily worked, subject to only slight limitations in use. (Norfolk, Marlboro, and similar soils.)
IIe.	Moderate erosion hazard (1) Coarse textured friable soils. (Norfolk, Ruston, and similar soils.) (2) Compact or fine textured subsoils. (Craven, Caroline, and similar soils.)

Land Capability Class and Subclass	
IIs.	Soils with moderate limitations of droughtiness and low fertility. (Thick surface phases of Norfolk, Ruston, and similar soils)
IIw.	Excess water hazard (1) Coarse textured friable soils, moderately well and somewhat poorly drained. (Goldsboro, Lynchburg, and similar soils.) (2) Friable and moderately friable soils, poorly drained. (Rains, Fallsington, and similar soils.) (3) Friable and moderately friable soils, very poorly drained. (Portsmouth, Hyde, and similar soils.)
IIIe.	Severe erosion hazard (1) Coarse textured friable soils. (Norfolk, Ruston, and similar soils.) (2) Compact or fine textured subsoils. (Craven, and similar soils.)
IIIs.	Soils with severe limitations of droughtiness and low fertility. (Lakeland loamy sands, Eustis loamy sands, and similar soils.)
IIIw.	Severe excess water hazard (1) Very coarse textured, poorly or somewhat poorly drained soils. (Klej, wet sands, and loamy sands.) (2) Fine textured, slowly permeable, poorly or somewhat poorly drained soils. (Bladen, Elkton, Lenoir, and similar soils.) (3) Fine textured, very poorly drained soils and mucky loams. (Bayboro, Hyde, and similar soils.)
IVe.	Soils with very severe erosion hazard. (Craven, Caroline, Marlboro, and similar soils).
IVs.	Soils with very severe limitations of droughtiness and low fertility. (Lakeland sands, Eustis sands, and similar soils.)
IVw.	Very severe excess water hazard (1) Poorly drained sands. (Plummer, Rutlege, and similar soils.) (2) Very fine textured, poorly drained soils with heavy surface textures. (Bladen, Elkton, and similar soils.) (3) Organic soils. (Peat and muck.)

Land Capability Class and Subclass	
	Piedmont
I.	Well drained, productive, easily worked, subject to only slight limitations in use. (1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.) (2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.)
IIe.	Moderate erosion hazard (1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.) (2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.) (3) Compact, fine textured and plastic soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, and similar soils.)
IIs.	Soils with moderate limitations of droughtiness and low fertility. (Thick surface sandy loams of very limited extent - Durham and Appling.)
IIw.	Moderate excess water hazard (1) Well drained first bottoms with variable overflow hazard. (Congaree). (2) Moderately well to somewhat poorly drained soils. (Colfax, Augusta.)
IIIe.	Severe erosion hazard (1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.) (2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.) (3) Compact, fine textured and plastic soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, and similar soils.) (4) Shallow A-C soils. (Goldston, Louisburg, Wilkes, and similar soils.)
IIIs.	Soils with severe limitations of droughtiness and low fertility. (Very coarse textured sands and loamy sands - Buncombe.)

Land Capability Class and Subclass	
IIIw.	Severe excess water hazard (1) Somewhat poorly drained soils with overflow hazard. (Chewacla.) (2) Somewhat poorly to poorly drained upland and terrace soils. (Worsham, Crabtown, and similar soils.)
IVe.	Very severe erosion hazard (1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.) (2) Medium to fine textured friable soils; loams, silt loams, clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.) (3) Compact, fine textured, plastic and shallow A-C soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, Goldston, Louisburg, Wilkes, and similar soils.)
IVs.	Soils with very severe limitations of droughtiness and low fertility. (Very coarse textured deep sands and loamy sands - Buncombe.)
IVw.	Very severe excess water hazard. (Poorly drained soils - Wehadkee, Roanoke.)

Mountains

I.	Well drained, level, productive terrace soils, subject to only slight limitations in use. (State, Masada, Hiwassee, and similar soils.)
IIe.	Moderate erosion hazard (gentle slopes) (1) Deep colluvial and well drained terrace soils. (Tusquitee, Hiwassee, Masada, and similar soils.) (2) Moderately deep to shallow upland soils. (Porters, Ashe, Hayesville, Halewood, and similar soils.)
IIw.	Soils with moderate excess water hazard (Well drained bottom land subject to overflow - Congaree.)

Land Capability Class and Subclass	
IIIe.	Severe erosion hazard (1) Deep colluvial and well drained terrace soils. (Tusquitee, Hiwassee, Masada, and similar soils.) (2) Moderately deep to shallow upland soils. (Porters, Ashe, Hayesville, Halewood, and similar soils.)
IIIw.	Soils with severe excess water hazard (Somewhat poorly drained bottom land subject to overflow - Chewacla.)
IVe.	Soils with very severe erosion hazard - D and E slopes. (Tusquitee, Porters, Hayesville, and similar soils.)

PART V

Some Suggested Cropping Systems for Each Land Capability Unit

The land on each farm, the economic conditions, and the desires of the farmer differ. In order to select the most desirable cropping system, the individual differences must be taken into account. The following suggested cropping system should serve as useful guides:

Coastal Plain

Class I Land - Well drained, productive soils, easily worked, subject to only slight limitations in use. (Norfolk, Marlboro, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (winter cover)	Tobacco (winter cover)	Tobacco (sm. grain)	Tobacco (winter cover)	Soybeans or Peanuts
2nd yr.:	Cotton or Peanuts (sm. grain-Fescue)	Corn or Cotton	Sm. Grain-Weeds	Cotton	Corn
3rd yr.:	Sm. Grain-Fescue	Peanuts (sm.grain-fescue)	Cotton, Corn or Peanuts	Corn	Cotton
4th yr.:		Sm. Grain-Fescue		Peanuts (winter cover)	

Coastal Plain

Class IIe Land - Moderate erosion hazard

(1) Coarse textured friable soils. (Norfolk, Ruston, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (sm.grain-fescue)	Tobacco	Tobacco or Peanuts (sm.grain)	Tobacco (sm. grain)	Corn or Cotton (winter cover)
2nd yr.:	Sm.Grain-Fescue	Tobacco (sm.grain-fescue)	Sm. Grain (lespedeza)	Sm.Grain-Weeds	Peanuts (sm.grain-fescue)
3rd yr.:		Sm.Grain-Fescue	Cotton or Corn (sm.grain-fescue)		Sm.Grain-Fescue (lespedeza)
4th yr.:		Fescue	Sm.Grain-Fescue		

(2) Compact or fine textured subsoils. (Craven, Caroline, and similar soils.)

1st yr.:	Cotton or Corn (sm.grain-fescue)	Corn	Tobacco (sm.grain-fescue)	Tobacco (winter cover)	Corn or Cotton (sm.grain)
2nd yr.:	Sm.Grain-Fescue (lespedeza)	Cotton or Peanuts (sm.grain-fescue)	Sm.Grain-Fescue	Tobacco (sm.grain-fescue)	Sm. Grain (lespedeza)
3rd yr.:		Sm.Grain-Fescue (lespedeza)		Sm.Grain-Fescue	
4th yr.:		Fescue-Lespedeza		Fescue	

Coastal Plain

Class IIs Land - Soils with moderate limitations of droughtiness and low fertility. (Thick surface phases of Norfolk, Ruston, and similar soils.)

	(a)	(b)	(c)	(d)	(e) *
1st yr.:	Tobacco or Cotton (sm. grain)	Sweet Potatoes (sm. grain)	Cotton or Peanuts (winter cover)	Corn (crotalaria)	Tobacco (crotalaria)
2nd yr.:	Sm. Grain (crotalaria)	Sm. Grain (weeds)	Tobacco (sm. grain)	Cotton or Peanuts (winter cover)	Corn (crotalaria)
3rd yr.:	Corn or Peanuts (sm.grain-fescue)	Tobacco	Sm. Grain (crotalaria)	Tobacco (sm. grain)	Cotton (winter cover)
4th yr.:	Sm.Grain-Fescue			Sm. Grain (crotalaria)	

Class IIw Land - Excess water hazard.

(1) Coarse textured friable soils, moderately well and somewhat poorly drained. (Goldsboro, Lynchburg, and similar soils.)

1st yr.:	Tobacco (sm.grain-fescue)	Tobacco (winter cover)	Tobacco (winter cover)	Tobacco (winter cover)	Truck (winter cover)
2nd yr.:	Sm.Grain-Fescue	Peanuts or Cotton (sm.grain-fescue)	Cotton	Corn	Corn
3rd yr.:		Sm.Grain-Fescue	Peanuts or Corn (sm.grain-fescue)	Peanuts (winter cover)	Soybeans
4th yr.:			Sm.Grain-Fescue	Cotton	

* Note: (e) This cropping sequence is for level or nearly level land with little or no erosion.

Coastal Plain

Class IVw Land (cont'd)

(2) Friable and moderately friable soils, poorly drained. (Rains, Fallsington, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Soybeans	Corn	Cotton or Peanuts	Corn	
2nd yr.:	Corn (Sm.Grain)	Truck (sm.grain)	Truck	Soybeans	
3rd yr.:	Sm. Grain (lespedeza)	Sm.Grain (lespedeza)	Soybeans		
4th yr.:		Soybeans			

(3) Friable and moderately friable soils, very poorly drained. (Portsmouth, Hyde, and similar soils.)

1st yr.:	Corn (sm.grain-fescue & L. clover)	Corn (sm.grain-L.clover)	Corn (sm.grain)	Corn	Corn
2nd yr.:	Sm. Grain-Fescue & L. Clover	Sm.Grain-L.Clover	Sm.Grain (lespedeza)	Soybeans	Soybeans
3rd yr.:	Fescue-L.Clover	L. Clover	Soybeans	Truck	
4th yr.:	Fescue-L.Clover				

Coastal Plain

Class IIIe Land - Severe erosion hazard

(1) Coarse textured friable soils. (Norfolk, Ruston, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (sm.grain-fescue)	Cotton or Corn (sm.grain)	Tobacco (winter cover)	Corn or Cotton	
2nd yr.:	Sm.Grain-Fescue	Sm. Grain (lespedeza)	Tobacco (sm.grain-fescue)	Milo or Corn (sm.grain-fescue)	
3rd yr.:	Fescue	Sm. Grain (lespedeza)	Sm.Grain-Fescue	Sm.Grain-Fescue (lespedeza)	
4th yr.:			Sm.Grain-Fescue	Fescue-Lespedeza	

(2) Compact or fine textured subsoils. (Craven, and similar soils.)

1st yr.:	Tobacco (sm.grain-fescue)	Corn (sm.grain-fescue)	Tobacco (sm.grain-fescue)	Cotton or Corn	Corn (sm.grain)
2nd yr.:	Sm.Grain-Fescue	Sm.Grain-Fescue (L. clover)	S.Grain-Fescue	Milo or Soybeans (sm.grain-fescue)	Sm.Grain (lespedeza)
3rd. yr.:	Fescue	Fescue-L.Clover	Fescue	Sm.Grain-Fescue (L.clover or lesp.)	
4th yr.:				Fescue & Legumes	
5th yr.:				Fescue & Legumes	

Coastal Plain

Class IIIs Land - Soils with severe limitations of droughtiness and low fertility. (Lakeland loamy sands, Eustis loamy sands, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Cotton or Corn	Tobacco	Tobacco (sm.grain)	Corn, Cotton, or Tobacco (sm. grain)	Corn (winter cover)
2nd yr.:	Sericea	Bahia Grass	Sm. Grain (crotalaria)	Sm. Grain (crotalaria)	Tobacco (sm.grain)
3rd yr.:	Sericea	Bahia Grass	Corn or Cotton (sm. grain)		Sm. Grain (crotalaria)
4th yr.:	Sericea	Bahia Grass	Sm. Grain (crotalaria)		
5th yr.:	Sericea				

Class IIIw Land - Severe excess water hazard.

(1) Very coarse textured, poorly or somewhat poorly drained soils. (Klej, wet sands, and loamy sands.)

1st yr.:	Corn (sm.grain)	Corn (sm.grain)	Tobacco or Truck	Corn	Corn (crotalaria)
2nd yr.:	Sm. Grain (lespedeza)	Sm.Grain (lespedeza)	Corn or Cotton (sm.grain-fescue)	Soybeans (sm.grain)	Cotton or Truck
3rd yr.:	Sm. Grain (lespedeza)	Soybeans (sm.grain)	Sm.Grain-Fescue	Sm. Grain (crotalaria)	Peanuts or Soybeans (sm.grain or winter cover)
4th yr.:		Sm. Grain (lespedeza)			

Coastal Plain

Class IIIw Land (cont'd)

(2) Fine textured, slowly permeable, poorly or somewhat poorly drained soils. (Bladen, Elkton, Lenoir, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn	Corn	Corn (winter cover)	Corn (winter cover)	Corn (winter cover)
2nd yr.:	Soybeans (sm.grain-fescue)	Soybeans (sm.grain)	Corn (sm.grain)	Corn	Soybeans
3rd yr.:	Sm.Grain-Fescue (L. clover)	Sm.Grain (lespedeza)	Sm.Grain (lespedeza)	Soybeans (sm.grain)	
4th yr.:	Fescue-L.Clover			Sm.Grain (lespedeza)	

(3) Fine textured, very poorly drained soils and mucky loams. (Bayboro, Hyde, and similar soils.)

1st yr.:	Corn (sm.grain-fescue)	Corn (sm.grain)	Corn	Corn	Potatoes (white)
2nd yr.:	Sm.Grain-Fescue (L. clover)	Sm.Grain (L. clover)	Potatoes (white) (sm.grain)	Soybeans (sm.grain)	Corn
3rd yr.:	Fescue-Clover	L. Clover	Sm.Grain (lespedeza)	Sm.Grain (lespedeza)	Soybeans
4th yr.:	Fescue-Clover	L. Clover			

Coastal Plain

Class IVe Land - Soils with very severe erosion hazard. (Craven, Caroline, Marlboro, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (sm.grain-fescue)	Corn or Cotton (winter cover)	Corn or Cotton (sm.grain-fescue)	Tobacco (winter cover)	Corn or Cotton (sm.grain)
2nd yr.:	Sm.Grain-Fescue	Sericea	Sm.Grain-Fescue (lespedeza)	Corn or Cotton (sm.grain-fescue)	Sm.Grain (lespedeza)
3rd yr.:	Fescue	Sericea	Fescue-Lespedeza	Sm.Grain-Fescue	Sm.Grain (lespedeza)
4th yr.:	Fescue	Sericea	Fescue-Lespedeza	Fescue	Lespedeza
5th yr.:		Sericea		Fescue	

Class IVs Land - Soils with very severe limitations of droughtiness and low fertility. (Lakeland sands, Eustis sands, and other similar soils.)

1st yr.:	Corn or Cotton (winter cover)	Tobacco (winter cover)	Corn or Cotton (crot.-sm.grain)	Corn or Cotton (crot.-sm.grain)
2nd yr.:	Sericea	Bahia Grass	Sm.Grain (crotalaria)	Sm.Grain (crotalaria)
3rd yr.:	Sericea	Bahia Grass	Sm.Grain (crotalaria)	
4th yr.:	Sericea	Bahia Grass		
5th yr.:	Sericea	Bahia Grass		

Coastal Plain

Class IVw Land - Very severe excess water hazard.

(1) Poorly drained sands. (Plummer, Rutlege, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn	Corn (sm.grain-fescue)	Corn	Corn (sm.grain)	Corn (sm.grain)
2nd yr.:	Soybeans (sm.grain-fescue)	Sm.Grain-Fescue (lespedeza)	Soybeans (sm.grain)	Sm.Grain (lespedeza)	Sm.Grain (crotalaria)
3rd yr.:	Sm.Grain-Fescue (lespedeza)	Fescue-Lespedeza	Sm.Grain (lespedeza)		
4th yr.:	Fescue-Lespedeza				

(2) Very fine textured, poorly drained soils with heavy surface textures. (Bladen, Elkton, and similar soils.)

1st yr.:	Corn	Corn (sm.grain)	Corn	Corn (sm.grain)	Corn (sm.grain)
2nd yr.:	Soybeans (sm.grain-fescue)	Sm.Grain (L.clover)	Soybeans (sm.grain)	Sm.Grain (lespedeza)	Sm.Grain (lespedeza)
3rd yr.:	Sm.Grain-Fescue (L. clover)	L. Clover	Sm.Grain (lespedeza)	Lespedeza	Soybeans (winter cover)
4th yr.:	Fescue-L.Clover	L. Clover	Lespedeza		

Coastal Plain

Class IVw Land (cont'd)

(3) Organic soils. (Peat and muck.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn	Corn	Corn (sm.grain)	Corn	Corn
2nd yr.:	Corn (sm.grain)	Soybeans (sm.grain-fescue)	Sm.Grain (lespedeza)	Soybeans (sm.grain)	Soybeans
3rd yr.:	Sm.Grain	Sm.Grain-Fescue (lespedeza)		Sm.Grain (lespedeza)	
4th yr.:	L. Clover	Fescue-Lespedeza			
5th yr.:	L. Clover				

The crops or sequence of crops should be changed as need arises to meet economic, erosion, fertility, weather, disease, insect, or other conditions.

"Winter cover" refers to a fall-seeded crop, or heavy plant residue from crops, from native vegetation, or from a combination of these.

Water control of "w" subclasses is necessary for highest production and most efficient use.

Piedmont

Class I Land - Well drained, productive, easily worked, subject to only slight hazards.

(1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco	Tobacco	Tobacco or Cotton (winter cover)	Cotton	Soybeans
2nd yr.:	Corn (sm.grain-fescue)	Corn or Cotton (sm.grain)	Corn (winter cover)	Corn (sm.grain)	Corn
3rd yr.:	Sm.Grain-Fescue	Sm.Grain (weeds)		Sm.Grain	Cotton
4th yr.:				Sm. Grain	

(2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgville, Mecklenburg, Davidson, and similar soils.)

1st yr.:	Cotton (sm.grain)	Cotton	Corn (winter cover)	Cotton
2nd yr.:	Sm.Grain (lespedeza)	Corn (sm.grain)	Cotton (winter cover)	Corn
3rd yr.:	Corn	Sm.Grain (soybeans)		

Piedmont

Class IIe Land - Moderate erosion hazard.

(1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (winter cover)	Corn	Tobacco (sm.grain-fescue)	Corn or Cotton (sm.grain)	Tobacco (sm.grain)
2nd yr.:	Corn (sm.grain-fescue)	Cotton (sm.grain)	Sm.Grain-Fescue	Sm.Grain (lespedeza)	Sm.Grain (weeds)
3rd yr.:	Sm.Grain-Fescue	Sm.Grain (lespedeza)			
4th yr.:	Fescue	Lespedeza			

(2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.)

1st yr.:	Corn (winter cover)	Corn	Corn or Cotton (sm.grain-fescue)	Corn or Cotton (sm.grain)	Corn (winter cover)
2nd yr.:	Cotton or Corn (sm.grain-fescue)	Cotton (sm.grain)	Sm.Grain-Fescue	Sm.Grain (lespedeza)	Cotton (sm.grain-fescue)
3rd yr.:	Sm.Grain-Fescue (lesp. or clover)	Sm.Grain (lespedeza)			Sm.Grain-Fescue (lespedeza)
4th yr.:	Fescue-Legumes	Lespedeza			

Class IIe Land (cont'd)

(3) Compact, fine textured and plastic soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (sm.grain-fescue)	Tobacco (winter cover)	Corn	Tobacco (sm.grain-fescue)	Cotton or Corn (sm. grain)
2nd yr.:	Sm.Grain-Fescue	Corn or Cotton (sm.grain-fescue)	Cotton (sm.grain-fescue)	Sm.Grain-Fescue	Sm.Grain (lespedeza)
3rd yr.:	Fescue	Sm.Grain-Fescue	Sm.Grain-Fescue (lesp. or clover)		
4th yr.:		Fescue	Fescue-Legumes		

Class IIs Land - Soils with moderate limitations of droughtiness and low fertility. (Thick surface sandy loams of very limited extent - Durham and Appling.)

1st yr.:	Tobacco (sm.grain)	Tobacco (sm.grain-fescue)	Corn (winter cover)	Corn (crotalaria)
2nd yr.:	Sm.Grain (crotalaria)	Sm.Grain-Fescue	Cotton (sm.grain)	Cotton (winter cover)
3rd yr.:	Corn or Cotton (sm.grain-fescue)		Sm.Grain (lespedeza)	Tobacco (sm.grain)
4th yr.:	Sm.Grain-Fescue			Sm.Grain-Crot.

Piedmont

Class IIIe Land - Severe erosion hazard.

(1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Tobacco (sm.grain-fescue)	Corn or Cotton (sm.grain-fescue)	Corn or Cotton (sm.grain)	Corn (winter cover)	Tobacco (sm.grain-fescue)
2nd yr.:	Sm.Grain-Fescue	Sm.Grain-Fescue (lespedeza)	Sm.Grain (lespedeza)	Tobacco (sm.grain-fescue)	Sm.Grain-Fescue
3rd yr.:	Fescue	Fescue-Lespedeza	Lespedeza	Sm.Grain-Fescue	
4th yr.:				Fescue	

(2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.)

1st yr.:	Corn or Cotton (sm.grain-fescue)	Sm.Grain (lespedeza)	Corn or Milo (sm.grain)	Corn or Cotton (winter cover)	Corn or Milo (sm.grain-fescue)
2nd yr.:	Sm.Grain-Fescue (lesp. or clover)	Lespedeza	Sm.Grain (lespedeza)	Milo (sm.grain-fescue)	Sm.Grain-Fescue (lespedeza)
3rd yr.:	Fescue-Legumes		Lespedeza	Sm.Grain-Fescue (lespedeza)	
4th yr.:	Fescue-Legumes			Fescue-Lespedeza	

Piedmont

Class IIw Land - Moderate excess water hazard.

(1) Well drained first bottoms with variable overflow hazard. (Congaree)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (sm.grain)	Corn (winter cover)	Corn (winter cover)	Corn (winter cover)	Corn (winter cover)
2nd yr.:	Sm.Grain (lespedeza)	Corn (sm.grain)	Corn (sm.grain-fescue)	Corn (winter cover)	Soybeans (winter cover)
3rd yr.:		Sm.Grain (lespedeza)	Sm.Grain-Fescue (lespedeza)	Soybeans (winter cover)	
4th yr.:		Lespedeza			

(2) Moderately well to somewhat poorly drained soils. (Colfax, Augusta.)

1st yr.:	Corn (sm.grain-fescue)	Corn (winter cover)	Corn (sm.grain)	Corn (winter cover)	Corn
2nd yr.:	Sm.Grain-Fescue (lespedeza)	Corn (sm.grain-fescue)	Sm.Grain (lespedeza)	Corn or Soybeans (sm. grain)	Soybeans (winter cover)
3rd. yr.:		Sm.Grain-Fescue (lesp. or clover)		Sm.Grain (lespedeza)	
4th yr.:					

Piedmont

Class IIIe Land - (cont'd)

(3) Compact, fine textured and plastic soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (sm.grain-fescue)	Tobacco (sm.grain-fescue)	Corn or Milo (sm.grain)	Corn (winter cover)	Milo (sm.grain)
2nd yr.:	Sm.Grain-Fescue (lespedeza)	Sm.Grain-Fescue	Sm.Grain (lespedeza)	Tobacco (sm.grain-fescue)	Sm.Grain (lespedeza)
3rd yr.:	Fescue-Lespedeza	Fescue	Lespedeza	Sm.Grain-Fescue	
4th yr.:				Fescue	

(4) Shallow A-C soils. (Goldston, Louisburg, Wilkes, and similar soils.)

1st yr.:	Corn (sm.grain-fescue)	Tobacco (sm.grain-fescue)	Corn or Cotton (sm.grain)	Tobacco (winter cover)
2nd yr.:	Sm.Grain-Fescue (lesp. or clover)	Sm.Grain-Fescue	Sm.Grain (lespedeza)	Corn (sm.grain-fescue)
3rd yr.:	Fescue-Legumes	Fescue	Lespedeza	Sm.Grain-Fescue
4th yr.:				Fescue

Piedmont

Class IIIs Land - Soils with severe limitations of droughtiness and low fertility. (Very coarse textured sands and loamy sands - Buncombe.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (winter cover)	Corn (sm.grain-fescue)	Corn (sm.grain)	Corn (sm.grain)	
2nd yr.:	Sericea	Sm.Grain-Fescue (lespedeza)	Sm.Grain (lespedeza)	Sm. Grain (crotalaria)	
3rd yr.:	Sericea	Fescue-Lespedeza	Lespedeza		
4th & 5th yr.:	Sericea				

Class IIIw Land - Severe excess water hazard.

(1) Somewhat poorly drained soils with overflow hazard. (Chewacla)

1st yr.:	Corn (sm.grain)	Corn (winter cover)	Corn (sm.grain)	Corn (winter cover)	Corn (winter cover)
2nd yr.:	Sm.Grain (lespedeza)	Corn (sm.grain-fescue)	Sm.Grain (lespedeza)	Corn or Soybeans (sm.grain)	Soybeans (winter cover)
3rd yr.:	Lespedeza	Sm.Grain-Fescue (lespedeza)		Sm.Grain (lespedeza)	
4th yr.:		Fescue-Lespedeza			

Piedmont

Class IIIw Land (cont'd)

(2) Somewhat poorly to poorly drained upland and terrace soils. (Worsham, Grabtown, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (sm.grain-fescue)	Corn (winter cover)	Corn (sm.grain)	Corn (sm.grain)	Corn
2nd yr.:	Sm.Grain-Fescue (lesp. or L.clover)	Corn or Soybeans (sm.grain-fescue)	Sm.Grain (lespedeza)	Sm.Grain (lespedeza)	Soybeans (sm.grain)
3rd yr.:	Fescue-Legumes	Sm.Grain-Fescue (lespedeza)	Lespedeza		Sm.Grain-Lesp.
4th yr.:		Fescue-Lespedeza			

Class IVe Land - Very severe erosion hazard.

(1) Coarse textured friable soils; sandy loams; fine sandy loams. (Cecil, Appling, and similar soils.)

1st yr.:	Corn or Cotton	Corn or Cotton (sm.grain-fescue)	Tobacco (sm.grain-fescue)	Sm.Grain (lespedeza)
2nd yr.:	Sericea	Sm.Grain-Fescue (lespedeza)	Sm.Grain-Fescue	Lespedeza
3rd yr.:	Sericea	Fescue-Lespedeza	Fescue	
4th yr.:	Sericea	Fescue-Lespedeza		
5th yr.:	Sericea			

Piedmont

Class IVe Land (cont'd)

(2) Medium to fine textured friable soils; loams; silt loams; clay loams. (Georgeville, Mecklenburg, Davidson, and similar soils.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Sm.Grain (soybeans or cowpeas)	Sm.Grain-Fescue (lesp.-R.clover)	Corn or Cotton (sm.grain-fescue)	Sm.Grain (lespedeza)	Corn (sm.grain-fescue)
2nd yr.:	Alfalfa-Orch.Grass	Fescue-Legumes	Sm.Grain-Fescue (lesp.-R.clover)	Lespedeza)	Sm.Grain-Fescue (lespedeza)
3rd yr.:	Alfalfa-Orch.Grass	Fescue-Legumes	Fescue-Legumes		
4th & 5th yr.:	Alfalfa-Orch.Grass				

(3) Compact, fine textured plastic and shallow A-C soils. (Vance, Creedmoor, Helena, Iredell, Orange, White Store, Goldston, Louisburg, Wilkes, and similar soil.)

1st yr.:	Sm.Grain-Fescue (lesp. or R.clover)	Tobacco (sm.grain-fescue)	Corn or Cotton (sm.grain-fescue)	Tobacco (sm.grain-fescue)
2nd yr.:	Fescue-Legumes	Sm.Grain-Fescue	Sm.Grain-Fescue (lespedeza)	Sm.Grain-Fescue
3rd yr.:	Fescue-Legumes	Fescue	Fescue-Lespedeza	
4th yr.:	Fescue-Legumes	Fescue		

Piedmont

Class IVs Land - Soils with very severe limitations of droughtiness and low fertility. (Very coarse textured deep sands and loamy sandy - Buncombe.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (winter cover)	Corn-Crotalaria (sm.grain)	Corn-Crotalaria (sm.grain)	Corn (sm.grain-fescue)	
2nd yr.:	Sericea	Sm.Grain (crotalaria)	Sm.Grain (crotalaria)	Sm.Grain-Fescue (lespedeza)	
3rd yr.:	Sericea	Sm.Grain (crotalaria)			
4th & 5th yr.:	Sericea				

Class IVw Land - Very severe excess water hazard. (Poorly drained soils - Wehadkee, Roanoke.)

1st yr.:	Corn (sm.grain-fescue)	Corn (winter cover)	Corn (sm.grain)	Corn (winter cover)
2nd yr.:	Sm.Grain (lesp.or L.clover)	Corn or Soybeans (sm.grain-fescue)	Sm.Grain (lespedeza)	Soybeans (sm.grain)
3rd yr.:	Fescue-Legumes	Sm.Grain-Fescue (lesp. or L.clover)	Lespedeza	Sm.Grain (lespedeza)
4th yr.:	Fescue-Legumes	Fescue-Legumes		

The crops or sequence of crops should be changed as need arises to meet economic, erosion, fertility, weather, disease, insect, or other conditions.

"Winter cover" refers to a fall-seeded crop, or heavy plant residue from crops, from native vegetation, or from a combination of these.

Orchard grass or other adapted tall perennial grasses can be used in place of fescue where desired; however, fescue is better suited for use in tobacco rotations and on sandy and wet lands.

Mountains

Class I Land - Well drained, level, productive terrace soils, subject to only slight limitations in use. (State, Masada, Hiwassee, and similar soils.)

	(a)	(b)	(c)	(d)
1st yr.:	Corn or Tobacco (winter cover)	Tobacco (sm. grain)	Corn (winter cover)	Corn or Tobacco (winter cover)
2nd yr.:	Corn or Truck (sm.grain-grass)	Sm.Grain-Weeds	Truck (winter cover)	Truck (winter cover)
3rd yr.:	Sm.Grain-Grass (lespedeza)		Tobacco (winter cover)	
4th yr.:			Truck (winter cover)	

Class IIe Land - Moderate erosion hazard (gentle slopes).

(1) Deep colluvial and well drained terrace soils. (Tusquitee, Hiwassee, Masada, and similar soils.)

1st yr.:	Corn or Tobacco (grass-clover)	Corn	Corn or Tobacco (winter cover)	Corn (winter cover)
2nd yr.:	Grass-Clover	Truck (sm.grain-grass)	Corn or Truck (grass-clover)	Truck (winter cover)
3rd yr.:		Sm.Grain-Grass (clover)	Grass-Clover	
4th yr.:		Grass-Clover (lespedeza)		

Mountains

Class IIe Land (cont'd)

(2) Moderately deep to shallow upland soils. (Porters, Ashe, Hayesville, Halewood, and similar soils.)

	(a)	(b)	(c)	(d)
1st yr.:	Corn or Tobacco (grass-clover)	Corn or Truck (grass-clover)	Corn or Tobacco (winter cover)	Corn or Truck (winter cover)
2nd yr.:	Grass-Clover	Grass-Clover (lespedeza)	Truck (sm.grain-grass)	Truck or Tobacco (sm.grain-grass)
3rd yr.:	Grass-Clover (lespedeza)		Sm.Grain-Grass (clover)	Sm.Grain-Grass (lespedeza)
4th yr.:			Grass-Clover (lespedeza)	

Class IIw Land - Soils with moderate excess water hazard. (Well drained bottom land subject to overflow - Congaree.)

1st yr.:	Corn (grass-clover)	Corn (grass-clover)	Corn (winter cover)	Corn (winter cover)
2nd yr.:	Grass-Clover	Grass-Clover (lespedeza)	Truck (sm.grain-grass)	Truck (winter cover)
3rd yr.:	Grass-Clover (lespedeza)		Sm.Grain-Grass (lespedeza)	

Mountains

Class IIIe Land - Severe erosion hazard.

(1) Deep colluvial and well drained terrace soils. (Tusquitee, Hiwassee, Masada, and similar soils.)

	(a)	(b)	(c)	(d)
1st yr.:	Corn (sm.grain)	Corn or Tobacco (winter cover)	Corn or Tobacco (grass-clover)	Corn or Truck (sm.grain)
2nd yr.:	Sm.Grain (alfalfa-Orch.grass)	Truck (grass-clover)	Grass-Clover	Sm.Grain
3rd yr.:	Alfalfa-Orch.Grass	Grass-Clover	Grass-Clover (lespedeza)	Grass-Lespedeza
4th yr.:	Alfalfa-Orch.Grass	Grass-Clover (lespedeza)		
5th yr.:	Alfalfa-Orch.Grass			

(2) Moderately deep to shallow upland soils (Porters, Ashe, Hayesville, Halewood, and similar soils.)

1st yr.:	Corn (winter cover)	Corn or Truck (grass-clover)	Tobacco or Corn (sm.grain)
2nd yr.:	Alfalfa-Orch.Grass	Grass-Clover	Sm.Grain (grass-clover)
3rd yr.:	Alfalfa-Orch.Grass	Grass-Clover (lespedeza)	Grass-Clover
4th & 5th yr.:	Alfalfa-Orch.Grass		

Mountains

Class IIIw Land - Soils with severe excess water hazard. (Somewhat poorly drained bottom land subject to overflow - Chewacla.)

	(a)	(b)	(c)	(d)	(e)
1st yr.:	Corn (grass-clover)	Corn or Truck (winter cover)	Corn (winter cover)	Corn (grass-clover)	
2nd yr.:	Grass-Clover	Corn (grass-clover)	Corn or Soybeans (sm.grain)	Grass-Clover (lespedeza)	
3rd yr.:	Grass-Clover (lespedeza)	Grass-Clover	Sm.Grain (grass-clover)		
4th yr.:		Grass-Clover (lespedeza)	Grass-Clover		

Class IVe Land - Soils with very severe erosion hazard - D and E slopes. (Tusquitee, Porters, Hayesville, and similar soils.)

1st yr.:	Corn (winter cover)	Sm.Grain-Grass	Corn or Truck (grass-clover)	Corn (sm.grain)	Corn or Truck (grass-clover)
2nd yr.:	Alfalfa-Orch.Grass	Grass-Clover	Grass-Clover	Sm.Grain (grass-clover)	Grass-Clover
3rd yr.:	Alfalfa-Orch.Grass	Grass-Clover (lespedeza)	Grass-Clover	Grass-Clover	Grass-Clover
4th yr.:	Alfalfa-Orch.Grass		Grass-Clover (lespedeza)	Grass-Clover	
5th & 6th yr.:	Alfalfa-Orch.Grass				

The crops or sequence of crops should be changed as need arises to meet economic, erosion, fertility, weather, disease, insect, or other conditions.

"Winter cover" refers to a fall-seeded crop, or heavy plant residue from crops, from native vegetation, or from a combination of these.

"Grass" means the tall perennial grasses such as Ky31 and Alta fescue and Orchard grass.

"Clover" has reference to biennial Red, Alsike or Ladino clover, and any of the other adapted tall white clovers.

Agricultural Experiment Station

North Carolina State College

Raleigh, N. C.

R. L. Loworn, Acting Director of Research

Bulletins of this station will be sent free to all citizens who request them.