The Development and Implementation of

The Virginia Agronomic Land Use Evaluation System

(VALUES)

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I. ABSTRACT

There is currently a great deal of concern about the movement of nutrients from agricultural land to surface and groundwater. Eutrophication due to nutrient enrichment has been suggested as the major factor causing the decline of living resources in the Chesapeake Bay. Agricultural activities are thought to provide one of the major nonpoint sources of nutrients reaching the Bay. There is also increasing evidence that nitrate contamination from agricultural activities may pose a threat to groundwater resources.

The Virginia Agronomic Land Use Evaluation System (VALUES) restructures and reorients soil test recommendations to include the best currently available scientific technology on water quality oriented nutrient management. This system has been developed for corn, soybeans, wheat, barley, rye, cotton, canola, peanuts and forage crops. Nitrogen (N), a key nutrient plant required for optimum crop production, as well as a potential contaminant, has been given particular treatment with respect to both rate of application and time of application. Information on specific rates of phosphorus (P) and potassium (K) fertilizer to use, as well as N, is provided for all major soils in Virginia.

II. INTRODUCTION

There is currently a great deal of concern about the movement of nutrients from agricultural land to surface and groundwater. Eutrophication due to nutrient enrichment has been suggested as the major factor causing the decline of living resources in the Chesapeake Bay. Agricultural activities are thought to provide one of the major nonpoint sources of nutrients reaching the Bay. There is also increasing evidence that nitrate contamination from agricultural activities may pose a threat to groundwater resources.

The Virginia Land Use Evaluation System (VALUES) restructures and reorients soil test recommendations to include the best currently available technology on water quality oriented nutrient management. This document explains the VALUES concept of preparing fertilizer recommendations.

III. SOIL PRODUCTIVITY

It is a conviction of these authors that one of the major crop yield determining factors in Virginia on non-irrigated, well drained and moderately well drained soil is the ability of the soil to retain water that is accessible to plants, or in the case of somewhat poorly and poorly drained soil, the presence of an effective drainage system to remove excess water. As obvious as this may seem, we believe it is very often overlooked when crop yields are contemplated and management inputs are planned.

Quite often, strikingly different soil properties, either physical or chemical, can have essentially the same effect on yield potential. For example, the very shallow, shale derived soils of the Appalachian and Northern Piedmont regions such as the Berks and Penn and the deep sands of the Coastal Plains Region such as the Alaga and Lakeland have essentially the same yield potential for a given crop due to the extremely limited ability to retain water that is accessible to plants. Although this limitation comes from strikingly different soil properties, the resulting similarity in crop yields that are obtained permits placing these soils in a similar yield category or grouping, henceforth to be referred to as "Soil Productivity Group."

When the poorly drained Coastal Plains soils such as the Acredale, Bladen and Portsmouth have effective drainage systems, they are very productive for crops such as corn and soybeans. These soils can be placed in the same Soil Productivity Group with the deep, well drained silt loam soils of the Northern Piedmont such as Chester, Manassas and Purcellville because of the similarity in yields. However, the Acredale and Purcellville soils must be managed differently because of differences in drainage and profile textural and depth properties. Therefore, Soil Management Groups were developed to recognize similar crop management practices. Obviously, the Acredale and Purcellville soils were not placed in the same Soil Productivity Group for alfalfa. This again reflects the interaction of soil properties with the production of a specific crop.

In the overall development of Soil Productivity and Soil Management Groups, soils were first placed in Soil Management Groups based on their similarity in profile characteristics, which require specific soil and crop management practices. A description of each Soil Management Group is given in Appendix Table A1. Following development of the Soil Management Groups, as much yield data as possible was assembled for soils within each management group.

Secondly, Soil Management Groups were placed in larger groups of soils that had similar yields for a given crop. These groups are the Soil Productivity Groups and were used for the determination of fertilizer rates, primarily N, since it is highly mobile in soil. Soil Productivity Groups for selected crops are given in Tables 1 and 2.

Table 1. Soil Productivity Groups vs. Soil Management Groups for Corn Grain

Soil Management Groups	Soil Productivity Groups	Realistic Yield, Bu/A
A, B	Ia	160
C, D	Ib	150
E, F, G, H, I	IIa	140
J, K, L, M, N, O, P	IIb	130
Q, R, S	IIIa	120
T, U	IIIb	110
V, W, X, Y, Z, AA	IVa	100
BB, CC, DD, EE, FF, GG, HH	IVb	85
II, JJ, KK, LL, MM, NN, OO PP, QQ	V	65

Table 2. Soil Productivity Groups vs. Soil Management Groups for Alfalfa and Alfalfa-Orchardgrass Hay

Soil Management Groups	Soil Productivity Groups	Realistic Yield, T/A
A, D, M	I	> 6 T/A
B, G, N, O	II	4-6 T/A
F, K, L, R, U, V, X	III	<4 T/A
		Not Suited:
C, E, H, I, J, EE, HH	IV - V	Too Wet
S, T, DD, GG, II		Droughty
Q, W, BB		Fragipans
Y, AA, KK		Claypan
CC, FF, JJ		Shallow Profiles

IV. SELECTING REALISTIC (VALUES) CROP YIELDS

Historically, yield goals have been and are used in conjunction with soil test results by some professionals as the basis for developing plant nutrient application rates. The difficulty with this approach is the implication that, even under non-irrigated conditions, one can continue to increase yields if additional amounts of production inputs such as plant nutrients are used. However, the best indication of the yield to expect and plan for in the coming year is **soil specific yields that have been obtained under good management in the past**.

It should be noted at this point that as new technologies are developed for crop management under non-irrigated conditions which make it possible to more effectively use limited soil moisture supplies, or if research in the biotechnology area is successful in developing plants that are more drought tolerant, yield expectations will need to be revised.

A. Characteristics of the Data

The information collected for this project were the yields and management practices for corn, soybeans and small grains. They were obtained from Virginia and other states with similar soils, temperature regimes (mesic and thermic) and cropping systems.

Visits were made in person or over the telephone to university and experiment station researchers, extension agents, and farmers. The data received was from university variety trials, research plots (maximum yield), small research plots, test demonstrations (field size), five acre clubs, actual farmers, maximum yield clubs, seed companies, theses and dissertations. The magnitude of the database is extensive, with over 2,000 accepted entries (out of a total of 3206 entries evaluated) of corn, soybean and small grain yields (436 of corn, 1,421 of soybean and 148 of wheat). In this respect, the database is quite unique - few studies of this type have utilized such a large data set containing carefully compiled records. For each entry, the following information was requested: crop, cultivar, type of data, yield, year, county, state, planting and harvesting dates, rotation, pest problems, soil series, soil classification, surface texture, maturity group, pounds of nutrients applied and methods of application, soil and tissue test information, remarks. The majority of yield information that was not accepted was because of a lack of soils data or that the contact could not remember which field the crop was grown. This project stresses the importance of keeping thorough field records.

The yield data accepted for use in this study are data that:

1. Could be associated with a specific soil series. If no soils information was available, the soils were characterized by a soil scientist when the field location was known.

2. Were obtained under the use of high crop management practices.

3. Were non-irrigated.

4. In the case of a low yield, it was determined whether it could be attributed to the failure to

use good crop management. If so, the data were omitted. If not attributed to poor management, it was assumed that the poor yield was due to the actual interaction of the crop, the soil and the rainfall/temperature pattern for that growing season, and the data were included in the study.

5. Covered the twenty-one year period from 1969 through 1989. Wheat is the exception to that rule. Due to advancement in breeding and actual field management technologies, wheat data were only included during the period 1979-1989.

In using this data to calculate realistic yield expectations, it was assumed that the weather which occurred during that twenty year period is the best indication available for the next period of time in question and therefore, the variation in yield that occurred is the variation that can be expected.

Actual yield data used are given in the appendix. The data for Soil Management Group T will be used to illustrate both the variability in yields over time and the method used for determining a realistic yield expectation.

Table 3. Corn Yields Used in the Determination of a Realistic Yield Expectation for Soil Management Group T.

Year	Yields, bushels per acre	Average*
1969	86,86	86
1970	130,130,57,86	101
1971	83,83,88,120	94
1972	108,132	120
1973	27,45	36
1974	84,116,148	116
1975	119,136	128
1976	86,120	103
1977	28,46	37
1978	92,126	109
1979	150,126	138
1980	45,45	45
1981	119,129	124
1988	103,102,101,131	109
1989	151,122,168,137,143,125,173, 145,172,168,163,157,154,152	152
Overall average		100

*Median Yield = 109 bu/A.

Because the number of yield values for a given year varied, it was decided to use the average yield for each year.

B. Nitrogen Application (Method Illustrated With Reference to Corn)

The following assumptions were made relative to nitrogen applications for corn in developing realistic yield expectations.

1. Wherever appropriate, the total nitrogen application would be divided between two or more applications with the timing, rate and method for each application being designed to increase the efficiency of utilization by the crop and to minimize the potential for surface and groundwater pollution.

2. The amount of nitrogen needed to produce a given yield of corn is one pound per bushel.

3. There will be sufficient residual soil nitrogen present in any given situation to produce at least 20 bushels of corn per acre.

The mean and the median yields for the data in Table 3 are 100 and 109 bushels, respectively. Given assumptions 2 and 3 above, if one assigns a price to the nitrogen being applied and the corn yields, net returns to nitrogen application over the years in question can be calculated if one were to have fertilized in each of those years for a specified yield. For example, suppose one had fertilized for the average yield of 100 bushels per acre. The result is given in Table 4.

Table 4. The Net Return Over Time to Nitrogen Application When Fertilizing for an Average Yield of 100 Bushels per Acre. Soil Management Group T. Data from Table 3.

Yield Bu/Acre	Cost of Excessive N Application, $/Acre[H]	Income Forfeiture due to Insufficient N, $/Acre[I]
36	16.00	0.00
37	15.75	0.00
45	13.75	0.00
86	3.50	0.00
94	1.50	0.00
101	0.00	0.00
103	0.00	0.00
109	0.00	0.00
109	0.00	0.00
116	0.00	0.00
120	0.00	0.00
124	0.00	10.00
128	0.00	20.00
138	0.00	45.00
152	0.00	80.00
TOTAL	50.50	155.00

H Calculation for 36 bu/A yield: 100 bu/A - 36 bu/A = 64 bu/A. 64 x $0.25/lb (price of N) = $16.00.

I Calculation for 124 bu/A yield: 124 bu/A - 120 bu/A (100+20=120) = 4 bu/A. 4 x $2.50/bu = $10.00.

In this example we assumed a cost of 25 cents per pound for nitrogen and a price of $2.50 per bushel for corn. The rate of N application was 100 pounds per acre (1 lb N needed per bushel of yield and fertilizing for the average yield of 100 bushels per acre). Also, remember the assumption of sufficient residual N to produce 20 bushels per acre. Therefore, yield losses due to insufficient nitrogen application would have occurred only in those years in which rainfall was sufficient for yields greater than 120 bushels per acre. Over the 20 year period, the total cost of the excess N applied when yields were less than 100 bushels was $50.50 per acre. However, the total value of the yield that would have been lost in those years when rainfall was sufficient to produce more than 120 bushels was $155.00 per acre. The difference of $104.50 per acre is a potential loss in net income over those years if corn had been fertilized at the rate of 100 lb N per acre. Therefore, fertilizing for the average yields carries a very severe economic penalty.

The optimum realistic yield for the data in Table 4 can be calculated by determining the yield at which the **difference** in cost between excess nitrogen applied and yield lost due to insufficient nitrogen is at a minimum, i.e., where the difference between column 2 and column 3 is at a minimum. For $0.25 nitrogen and $2.50/bu corn, **the realistic yield is 111 bushels/A**. This is described in Table 5.

Table 5. Summary of Calculations from Table 4 to Determine Optimum Realistic Yield.

Target Yield Bu/Acre	(Column 2) Total Cost of Excessive N Application, $/Acre	(Column 3) Total Income Forfeiture due to Insufficient N, $/Acre	Difference Between Col. 2 and Col. 3
100	50.50	155	104.50
109	65.75	80	14.25
110	68.00	75	7.00
111[H]	70.25	70	-0.25
112	72.50	65	-7.50
113	75.00	60	-15.00

H Realistic Yield

The data in Table 6 show the effect of changing nitrogen and corn prices on the yield for which one should fertilize. The nitrogen:corn price ratio over time remains fairly constant at about 10:1. Wide fluctuations in nitrogen and corn prices dictate only small changes in the optimum realistic yield of corn for which one should fertilize when grown on those soils in Soil Management Group T. This is also true for all of the Soil Management Groups that are suitable for use in corn production.

The procedure used to calculate a realistic yield expectation for corn when grown on soils in Soil Management Group T was used to calculate a realistic yield expectation for corn for all other Soil Management Groups. It should be noted that there is unavoidable natural variability inherent with this approach as with all other approaches used for calculating the most optimum N fertilizer rate to use. In this study, large differences in yield from the mean were observed about two out of every ten years. Statistical treatment of the data for Soil Management Group T produced the following results: standard deviation - 35.5, standard error of the mean - 9.17, confidence interval estimates - 100∀16.1 bu (90%) and 100∀19.7 bu (95%). Variability in use of this approach is recognized and some flexibility should be given to the actual N fertilizer rate to use rather than promoting an individual N rate as a firm precise single number.

Table 6. The Effect of Changing Corn and Nitrogen Prices on the Realistic Yield Expectation for Soils in Soil Management Group T.

Corn Price	N Price	Realistic Yield Expectation
$2.00	$0.15	114
$2.00	$0.20	111
$2.00	$0.25	109
$2.00	$0.30	107
$2.50	$0.15	116
$2.50	$0.20	113
$2.50	$0.25	111
$2.50	$0.30	109
$3.00	$0.15	117
$3.00	$0.20	115
$3.00	$0.25	113
$3.00	$0.30	111

Regarding the other crops investigated for this study, i.e., soybeans, small grains and forage crops, the selection of optimum yields was based on factors other than the cost of N fertilizer. This is described in the individual sections pertaining to each crop beginning on page 11.

C. Phosphorus and Potassium Application

When determining the yield for which one should manage and the rate of phosphorus and potassium one should apply, two basic relationships are important. First of all, residual phosphorus and potassium levels in the soil are more readily increased through nutrient application and cropping sequence than is nitrogen, a much more mobile and leachable element. Secondly, the effect of the interaction between nutrient application rate and soil moisture availability on crop yield is much less pronounced for phosphorus and potassium than it is for nitrogen because nitrogen movement is principally by mass water flow, which causes major fluctuations in its availability. Therefore, the existing availability of phosphorus and potassium in the soil, measured by a soil test, becomes the major consideration for these two nutrients rather than the productive potential of the soil in question.

The availability of phosphorus and potassium in fields used for the production of the more important agronomic crops is given for each of the major physiographic regions in Table 7. In the soil test calibration used by the Soil Testing and Plant Analysis Laboratory at Virginia Tech, the break between the Medium and High test levels is the soil test level above which a yield increase is not expected from a broadcast application of that nutrient. It should be noted that practically all of the Coastal Plains soils that have sandy surface textures but heavy sandy loam or heavier subsoil textures have large amounts of accumulated potassium in the upper part of the subsoil. If the subsoil in these soils is within 20 to 25 inches of the surface, this accumulated potassium must be taken into consideration if one expects to predict, with any degree of accuracy, whether or not a potassium application will increase crop yields.

Table 7. The Availability of Phosphorous and Potassium in Fields Used in the Production of Selected Crops in Virginia.[1]

Physiographic Region	Crop	Percentage of total acreage testing High plus Very High: Phosphorus	Potassium
Northern Coastal Plain	corn	64	24
	small grains	61	16
	soybeans	63	18
Southern Coastal Plain	corn	87	12
	peanuts	91	12
	small grains	83	18
	soybeans	77	14
Northern Piedmont	corn grain	39	42
	corn silage	58	44
	small grains	47	50
	alfalfa establishment	44	39
	alfalfa hay (maintenance)	70	62
	red clover establishment	30	30
	red clover hay	36	28
Southern Piedmont	corn grain	49	21
	corn silage	73	46
	small grains	50	33
	soybeans	62	14
	tobacco, flue	83	19
	tobacco, other	55	21
	alfalfa establishment	42	32
	alfalfa hay (maintenance)	63	44
	red clover-grass hay establishment	39	29
	red clover-grass hay (maintenance)	48	31
Mountain Region	corn grain	56	42
	corn silage	73	54
	small grains	74	62
	burley	77	61
	alfalfa establishment	58	40
	alfalfa hay (maintenance)	71	48
	red clover-grass hay establishment	42	36
	red clover-grass hay (maintenance)	43	25
	tall grass hay	43	27

[1] Fiscal year 1987 Virginia Soil Test Summary. Soil Testing and Plant Analysis Laboratory, Department of Crop and Soil Environmental Sciences, Virginia Tech, Blacksburg, VA. Mehlich 1 extractant used for P and K determination.

The purpose of this discussion on phosphorus and potassium is to show that in most cases the need for application is one of maintenance requiring relatively small applications. Therefore, soil productivity becomes less important than it is when determining rates of nitrogen application.

D. Corn - Nitrogen Management

It is recommended that the total nitrogen (N) application for corn be divided between an application made at planting and one when the corn is 12 to 18 inches tall. This recommendation is made for all soil management groups because they can be placed in one of three major groupings. One is those soils which, due to the sandy texture of the profile, have a high potential for nitrate leaching into groundwater.

A second group would be those soils in which drainage is impeded to the extent that denitrification losses are expected to be significant in most years. Delaying a part of the total N application until the crop is 12 to 18 inches tall should reduce denitrification and increase plant uptake of the applied N.

The third group would be those well drained soils in which profile characteristics are such that leaching of applied N below the rooting depth would not be expected in most cropping seasons. However, these soils are also the ones most likely to have significant amounts of nitrate N in them at sidedressing. The major sources of this nitrate are most likely to be the oxidation of previously applied animal manures, indigenous organic matter, and previously applied N fertilizers. A soil test of the top twelve inches for nitrate N in situations where large amounts of N have been applied may well indicate that none or only a portion of the planned application is needed. If one applies all of the N at planting, an opportunity may have been missed to make a significant and needed adjustment in total application rate and may have created a situation which will result in significant amounts of nitrate being left in the soil after the crop is harvested. This excess nitrogen may be leached below the crop rooting zone during the following winter and be eventually moved into groundwater. In situations where a large amount of residual N is suspected, a soil nitrate test may be of value.

1. Nitrogen Application at Planting

The method of application at planting will determine the amount of N that should be applied. Let us assume that the total amount of N to be applied is 125 lbs/A. If the N is to be broadcast at planting, 60 to 70 pounds per acre will be needed at that time. However, if fertilizer banding equipment is used, 30 pounds of N per acre applied in the starter fertilizer will be sufficient. The remainder of the total application for both methods would be applied as a sidedressing when the corn is 12 to 18 inches tall, which is when plant N uptake is much greater. Utilization of fertilizer banding equipment will most definitely reduce the **potential** for N runoff and gaseous N loss. The key to the rate of application at planting is not the amount applied per acre but the concentration of N in the immediate vicinity of the small root system of the young corn plants, i.e., the difference in the rate of application per acre is based on the method of application.

2. Method of Sidedressing Nitrogen

An important fact relative to sidedressing N is that corn plant roots will have met in the center of the row by the time plants are about 24 inches tall. An exception to this would be the case where interrow traffic has compacted the soil to the point where root growth into the middle of the row is restricted. If something such as soil compaction has prevented roots from reaching the center of the row, obviously sidedressed N placed there will not be taken up. Whether or not this condition exists must be determined on a field by field basis and taken into consideration when selecting a method of sidedress application.

Nitrogen solution can be applied as a broadcast application using spray booms with drop nozzles equipped with fan tips. With this method, a contact herbicide can also be applied.

Nitrogen solution can be applied in a stream down the center of the row by placing plastic tubing over the nozzle on the spray boom and allowing the opposite end to run on the soil surface. One should give consideration to whether or not soil compaction will interfere with N uptake if the stream is placed in the center of the row. Placing the stream more closely to one side of each row would avoid any mid row soil compaction problems.

Nitrogen can also be applied in dry granular form broadcast over the top when corn is 12-18" high. Either granular urea or ammonium nitrate can be used. There will be less burn using urea. Do not apply when foliage is wet with dew.

Finally, N can be injected into the soil (if this equipment is available) which will reduce the possibility for N volatilization, particularly when using urea as the N source. Also, potential N surface runoff will be eliminated or greatly reduced.

E. Soybeans

Nitrogen applications have been found to increase soybean yields in two situations. One is the situation in which they are grown under very carefully controlled moisture regimes (i.e., soil moisture greater than 80% of field capacity at all times) and yields exceed 80 bu/A. Such yields required drip irrigation, very narrow rows, high populations and ample applications of phosphorus, potassium, secondary and trace elements. The other situation where N applications increase yields is when nitrogen fixation is seriously restricted for some reason. Under more normal conditions of soybean production, nitrogen has seldom been shown to increase yields and its application is not recommended.

Soybean response to phosphorus and potassium applications is quite similar to that of corn. Therefore, the same recommendations are used for both crops.

The yield data we have assembled show soybean yields to be as variable as those for corn. We believe this variability was also caused by the interaction of the crop, the soil and the rainfall/temperature pattern for each growing season. The yields approximate a normal distribution, and the standard deviation of mean yield for Soil Management Groups increases as the mean yield for management groups decreases. This appears to be characteristic of crop yields obtained under evenly distributed average rainfall of three to four inches per month and on soils with a limited ability to retain water that is accessible to plants. The more restricted this ability becomes the more variable the crop yields will be over time and the lower the average yield will be. Selected yield data are given in Table 8.

Table 8. Mean Soybean Yields and Their Standard Deviations for Five Soil Management Groups.

Soil Management Group	Representative Soil Series	Numbers of Observations	Mean Yield	Standard Deviation
C	Acredale	100	42.7	6.2
R	Norfolk	271	37.0	8.5
S	Kempsville	68	35.2	8.1
X	Cecil	169	34.5	11.0
T	Suffolk	173	33.5	9.7

The soils in Soil Management Group C developed under poorly drained conditions and are classified as being poorly drained. However, when an effective drainage system is installed to remove the excess water, some of the highest and least variable yields can be obtained.

Because nitrogen is applied to soybeans only under very special and unusual management conditions and phosphorus and potassium applications are based primarily on soil test levels, nutrient application rates were of less concern in arriving at realistic yield expectations. In developing the VALUES yield for each Soil Management Group, both the mean and modal yields were taken into consideration. When using these yields in farm planning, it will hopefully help keep one from being either too pessimistic or optimistic. Yield expectations for each management group are given in the appendix.

It should be pointed out that VALUES yield expectations do not take into consideration the comparative risk associated with crop production on soils in the various management groups. For example, one must cope with not only a lower average yield but also a much greater year-to-year variation in yield of soybeans grown on soils in Management Group X when compared to yields and their variability obtained on soils in Management Group C. This relationship between yield and the variability of that yield exist for all the crops for which data were collected. Clearly, this raises an interest in the application of risk management and game theory to decision making relative to crop production on these soils and might be an appropriate extension of this study.

F. Small Grains

In Virginia, rainfall will normally equal evapotranspiration, i.e., the loss of soil water through surface evaporation plus that lost through plant transpiration, during the fall and spring periods. It exceeds evapotranspiration during the winter. Small grains are produced during that period when soil moisture is usually adequate or excessive. Therefore, the ability of the soil to retain plant available water is far less of a yield determining factor for small grains than it is for summer annual and perennial crops. Soil productivity potential is likewise of less concern in planning nutrient applications for production of these crops.

Water quality and profitability concerns that relate to nutrient applications for small grains production are to avoid excessive applications of phosphorous and potassium based on soil tests and to avoid excessive applications of nitrogen based on soil tests, plant tissue analysis, and crop conditions such as tiller counts and leaf color observed at a specific stage of crop development. These concerns also necessitate the timing of nitrogen application so as to coincide with periods of maximum plant uptake. Timing of nitrogen applications is particularly important on those soils with leaching indices of 10 or greater. All of these practices will help to minimize nutrient movement into ground and surface waters and to maximize plant utilization.

Phosphorus and potassium applications based on soil tests are standard and well established. The use of a nitrate soil test as a basis for determining application rates is less well defined. However, current recommendations on use of the nitrate soil test plus plant tissue nitrogen concentration and crop growth conditions in determining rate and time of nitrogen application are given in the section which contains the details of the recommendations.

G. Hay and Forage Crops

Yields for forage crops were not obtained in the survey of information sources in the mid-Atlantic Region. However, yields and nutrient recommendations for these crops were revised and updated by evaluating the available research data on yields vs. crop fertilization from Virginia as well as neighboring universities in the region. This information plus the addition of new soil series and the development of the Soil Management Groups were used in preparing realistic yield expectations and nutrient recommendations. These are given for each of these crops in the appendix.

V. VALUES - HOW THE SYSTEM WORKS

The following information will be requested on the Soil Sample Information Sheet:

A. Crop to be grown
B. Soil Map Units identifying soils in field
C. Farmer Yield Estimate
D. Drained/not drained
E. Will/has manure/sludge been used in this field in the past
F. Previous crop

The format for requesting information and use of information are discussed in the following sections:

A. Crop to be Grown:

1. Format for requesting information:

Crop to be grown _____________

2. Use of Information:

Each crop has its own nutrient requirement. This is taken into consideration when making the recommendation.

B. Soil Map Units :

Soil Map Unit symbol requested rather than soil name because it will give soil series and type, slope phase and degree of erosion, all of which influence projected yield. A short discussion of Soil Map Units will be placed on the back of the Soil Sample Information Sheet which will accompany each soil sample.

1. Format for requesting information:

Soils Information*	
Soil Map Unit** Symbol for:	Percent (%) of Field
Largest area	___
2nd largest area	___
3rd largest area	___

* Include only those areas that make up at least 20% of the field.

** May be obtained from the SCS Conservation Plan for your farm or the County Soil Survey Report.

2. Use of information:

a. Calculating yield for field.

(1) If no soils information or farmer yield estimate is given, default to group IVa for corn, IV for small grains and soybeans, III for alfalfa, IIIb for red clover-grass, IV for pasture, orchardgrass/fescue hay production, and III for canola. Put comment on Soil Test Report that reads, "Soil Survey map unit information was not provided. As a result only generalized fertilizer and lime recommendations could be made. Field specific and more scientifically based recommendations can be provided if soil map unit information is included in the future. Contact your extension agent to learn how to obtain available soil survey information for your farm."

(2) If only 1 Soil Map Unit given, select appropriate yield from Soil Productivity Group table.

(3) If 2-3 Soil Map Units given, calculate weighted mean to determine VALUES yield.

For example:

Soil Mapping Unit	Expected Yield	% of Field	Fraction of Total Yield*
1	130	50	65
2	125	30	38
3	120	20	+24
	Weighted mean =		127

* 130 x 0.50 = 65, etc.

Note: if a soil occupying <30% is strongly contrasting [>20% yield difference from dominant soil (soil occupying greatest percent or highest yielding if more than one have same percent of total area)], then <u>do not use it</u> in determining realistic yield expectation for the sampled area.

If strongly contrasting soil occupies ∃30%, use weighted mean for all soil listed to determine VALUES yield.

For fields greater that 20 acres in size with ∃30% of a soil that is strongly contrasting with the dominant soil, write "This field contains significant areas of soils with strongly contrasting yield expectations. These soils should be managed separately, if they lay such that it is possible. Soil map unit __ has a realistic yield expectation of __ and soil map unit(s) __ (and __) has (have) a realistic yield expectation of __. The fertilizer recommendation that follows is based on average conditions. Sampling and management should be done separately in the future."

b. Utilizing leaching index information.

Each Soil Map Unit has leaching index information associated with it. If the leaching index is 10-15, the following comments will be printed on the Soil Test Report:

(1)All small grain - "Soils in this field have a very high nitrogen leaching potential. It is important that the total nitrogen topdressing be split between an application at Feeks growth state 25 (February) and one at Feeks growth stage 30 (March). The application rate at Feeks growth stage 30 should be based on a plant tissue analysis for nitrogen."

(2) Canola - "Soils in this field have a moderately high nitrogen leaching potential. The total nitrogen topdressing should be split between an application in February and one made in March."

(3)Corn - "Soils in this field have a high nitrogen leaching potential. It is important that the total nitrogen be split between time of planting and a sidedressing application."

If leaching index is greater than 15, the following comments will be printed:

(1)All small grain - "Soils in this field have a very high nitrogen leaching potential. It is <u>extremely important</u> that the total nitrogen topdressing be split between an application at Feeks growth stage 25 (February) and one at Feeks growth stage 30 (March). The application rate at Feeks growth stage 30 should be based on a plant tissue analysis for nitrogen."

(2)Canola - "Soils in this field have a very high nitrogen leaching potential. It is extremely important that the total nitrogen topdressing should be split between an application in February and one made in March."

(3)Corn - "Soils in this field have a very high nitrogen leaching potential. It is extremely important that the total nitrogen be split between time of planting and a sidedressing application."

c. Utilizing Erosion/Slope information.

Soil mapping units provide information on severity of erosion as well as slope yield information. If multiple yield reductions occur in a field, for example, a rocky soil (10% yield reduction) with severe erosion (30% yield reduction) on a class D slope in the ridge and valley physiographic region (25% yield reduction), the most limiting reduction would be used (30%) as opposed to an additive factor (65%).

(1) Yield Adjustment According to Erosion:

Erosion Classes	% Yield Reduction
slight and moderate (1 and 2)	0
severe (3)	25

(2) Yield Adjustment According to Slope:

Slope Classes	% Slope Coastal Plain	% Slope Piedmont, Mountain Regions	% Yield Reduction for Row Crops and Hay Conv. till*	No till*	% Increase in Acres/Animal Unit**
A	0- 2	0- 2	--	--	--
B	2- 6	2- 7	--	--	--
C	6-10	7-15	12	6	--
D	10-15	15-25	20	10	25
E	15-25	25-45	too steep for tillage		50
F	25+	45+	too steep for tillage		50

*A and B are equal and are the class standard.
**A, B and C are equal and are the class standard.

(3) Yield Adjustment According to Coarse Textures: Exclude group GG since coarse textures are part of its series criteria.

1. Fine gravelly, gravelly (gritty), cherty - 10% yield reduction

2. Cobbly, angular cobbly, channery, flaggy, slaty, shaly - 15% yield reduction

3. Very gravelly, extremely gravelly, very cherty - 20% yield reduction

4. Very cobbly, extremely cobbly, very channery, very flaggy - 25% yield reduction

(4) Yield Adjustment According to Rock Outcrop:

Rocky - 10% yield reduction

Bouldery, very bouldery, very rocky, stony, very stony - 25% yield reduction for pasture, not suited to row crops

Extremely bouldery, extremely rocky, extremely stony (rubbly) and all complexes with rock outcrop - 50% yield reduction for pasture, not suited to row crops

Karst - no row crops, avoid use of pesticides, extreme caution in use of fertilizers or organic nutrient sources

C. Farmer Yield Records:

Request for farmer's yield estimate is included to permit those farmers who keep careful field records to provide his own yield information upon which the fertilizer recommendation can be based. A short discussion on keeping/providing accurate yield records will be placed on the back of the Soil Sample Information Sheet.

1. Format for requesting information:

Your proven yield for this field __________ (Bu/A, Tons/A. Circle one).

2. Use of information

Farmer proven yield used in determining fertilizer rate.

D. Drainage Category

1. Format for requesting information

Has a drainage system been installed in this field? Yes ________ No ________

2. Use of Information

If field has been drained, the computer will select a "drained" category with higher expected yields for the estimate.

E. Manure/Sludge Use.

1. Format for requesting information:

Will/has manure/sludge been used in this field? Yes ________ No ________

2. Use of Information:

If answer is "Yes," appropriate computer comments related to N application will be printed (see Corn fertilization section).

F. Previous Crop.

1. Format for requesting information:

Last crop? ____________________

2. Use of Information:

If crop was a legume, N fertilizer rates will be reduced according to the information in the following table:

Legume Credits

Crop	% Stand	Description	Residual N (Lb/A)
Alfalfa	50-75	Good (>4 T/A)	90
	25-49	Fair (3-4 T/A)	70
	<25	Poor (<3 T/A)	50
Red Clover	>50	Good (>3 T/A)	80
	25-49	Fair (2-3 T/A)	60
	<25	Poor (<2 T/A)	40
Hairy Vetch	80-100	Good	100
	50-79	Fair	75
	<50	Poor	50
Peanuts			45
Soybeans			*

* One-half (2) lb N/bu of soybeans. If yield information is not available, credit the soybean crop with 20 lb N/A.

APPENDIX A

Table A1. Soil Characteristics For Soil Management Groups

The following summaries describe the general soil characteristics that are related to crop production. The purpose of this write-up is to focus on the common soil feature(s) of the management groupings that relate to management and productivity. The format includes the following soil characteristics:

Regional occurrence
Parent material
Landscape position or influence
Solum thickness
Dominant profile feature, texture or other feature
Plant available water supplying capacity
Internal soil drainage

(A) The soils in this grouping occur over several physiographic provinces, have formed in alluvial parent materials, and are on gently sloping landscapes of flood plains or stream terraces whose watersheds originate west of the Blue Ridge. They are deep, medium textured soils throughout, with high water supplying capacities, and are well drained.

(B) Soils formed from alluvium within the Coastal Plain region and are associated with stream and river terraces. They are deep soils, with loamy textures throughout, have high water supplying capacities, and are well to moderately well drained.

(C) Soils formed from alluvium or coastal plains sediments, on terraces, levees, and broad coastal plain landscapes. They have loamy to silty textures throughout, have high water supplying capacities, and are poorly drained unless artificial drainage is provided which increases their productive capacity significantly.

(D) Soils which occur in the Northern Piedmont region on upland landscapes and have formed from a variety of residual parent materials. They are moderately deep soils, with fine loamy textures, moderately high water supplying capacities, and are well to moderately well drained.

(E) Soils formed from sandy coastal plain sediments, on low lying terraces, depressions, or flats where surface drainage is restricted. They are deep soils with coarse loamy textures throughout, commonly have high water tables even during some parts of the growing season, and thus are high water suppliers, and are poorly drained.

(F) Soils formed in coarse textured coastal plain sediments, in low lying landscape positions and are underlain by stratified loamy sediments. The are deep soils, with coarse loamy textures throughout, are high to moderately high water suppliers, and are some what poorly drained.

(G) Soils occurring from the Piedmont region westward, formed in locally transported , medium textured sediments of either colluvial or alluvial origin that overlay a wide range of residual materials. Located in landscape positions ranging from foot and toe slopes, to the heads of drainage ways, to depressions, to narrow upland drainage ways. They are deep soils with silty to loamy upper subsoils underlain with clayey to stony materials. They have moderately high water supplying capacities and range from moderately well to somewhat poorly drained.

(H) Soils located predominantly in the western Piedmont and mountainous regions and formed in alluvium along streams or terraces. They are moderately deep, have silty to clay loam subsurface textures, and are moderately high water suppliers. They are somewhat poorly to poorly drained unless artificial drainage is provided which increases their productive capacity significantly.

(I) Soils formed from alluvium along floodplains in the Coastal Plain and Piedmont provinces. As a result they are somewhat prone to hazards of flooding. They are deep soils with predominantly clay loam subsurface horizons, moderately high water suppliers, and are somewhat poorly drained.

(J) Soils formed from coastal plain sediments in low-lying landscape positions. They are deep soils with loamy subsurface horizons, moderately high water supplying capacity, and range from somewhat poorly to moderately well drained.

(K) Soils located mainly within the Coastal Plain region, forming from mixed marine and fluvial sediments on landscapes that range from stream terraces to broad, nearly level interfluves in uplands. They are deep soils with loamy surfaces and clay loam to clayey subsurfaces, are moderate water suppliers, and are somewhat poorly drained.

(L) Soils common to the Piedmont and mountainous regions where they have formed from old transported deposits of alluvium or colluvium. They are common on stream terraces, foot slopes, and older, elevated, upland landscapes that were once stream terraces. They are deep soils with medium textured surfaces, more clayey subsurfaces, and commonly with gravels and rounded stones. They are moderate to high water suppliers and usually are well drained.

(M) Soils found mostly in the mountainous regions forming in material weathered from carbonate rocks. They are on upland summit and sideslope positions. They are deep soils with reddish brown, clayey subsurface horizons, sometimes with coarse fragments. They are moderate water suppliers, unless coarse fragment contents are significantly high, and they are well drained.

(N) Soils located on dissected uplands in the Piedmont region, and have formed from residuum ranging from weathered mafic rocks to triassic sediments. They are deep to moderately deep, have medium textured surfaces with reddish brown clayey subsurfaces, are moderate water suppliers, and are well drained.

(O) Soils formed from transported materials ranging from mountain colluvium to old alluvium on dissected uplands of the Piedmont and mountainous regions and as old elevated river terrace deposits. They range from deep to shallow, have very dark red clayey subsurface horizons, some may have significant coarse fragments, are moderate water suppliers, and are well drained.

(P) Soils formed in alluvium or colluvium and are in low lying terrace positions. All the physiographic provinces in Virginia are represented by one or more soils of this group. They are deep soils with clayey subsurface horizons and are moderate to high water suppliers. They are somewhat poorly drained unless artificial drainage is provided which increases the productive potential significantly.

(Q) Soils located on the upper Coastal Plains on the most stable parts of the nearly level upland landscape. They have formed in very old coastal plain sediments. They are deep soils with sandy surfaces and clayey to sandy clay subsurfaces with plinthite and/or a fragipan in the lower subsoil which may inhibit root growth. They are moderate to moderately low water suppliers when the plinthite or fragipan is nearer the surface. They are moderately well to somewhat poorly drained depending on the depth to the plinthite or pan layer.

(R) Soils located on the gently sloping uplands of the Coastal Plain and have formed from marine sediments. They are deep soils with sandy loam surfaces, reddish yellow clayey to clay loam subsurfaces with some mottles in the lower part, are moderate water suppliers, and are well to moderately well drained.

(S) Soils found on gently sloping coastal plain uplands, are moderately deep, and have formed from loamy coastal plain sediments. They have fine loamy textures in the subsoil with moderate to high water supplying capacities, and are well to moderately well drained.

(T) Soils located on uplands and stream terraces in the coastal plains, are deep and have formed from loamy coastal plain sediments. They have fine loamy subsurface textures, usually underlain by coarser sediments, are moderate water suppliers, and are well drained.

(U) Includes soils in the mountainous and Piedmont regions that are moderately deep to shallow, and have formed from a variety of residual parent materials ranging from triassic sediments to sandstone, shales, and limestone, to colluvium from these materials. They commonly have fine loamy subsurface textures, commonly have coarse fragments to one third the soil volume, and as a result, are moderate to moderately low water suppliers. They are well to moderately well drained.

(V) Soils found on upland landscapes in the Piedmont, are moderately deep, and have formed from saprolites derived from a variety of parent materials ranging from slates, to granites, gneisses, schists, and more basic granitic rocks. They have clayey subsurface horizons, are moderates water suppliers, and are well drained.

(W) Includes soils in the mountainous and Piedmont regions, on stream terrace or footslope positions, and are formed from mixed colluvium. They have fragipans within the upper three feet of soil, have loamy subsurface horizons, commonly with accompanying coarse fragments. As a result they are moderately low water suppliers, and range from moderately well to somewhat poorly drained.

(X) Soils located on upland landscapes in the Piedmont region, are moderately deep, and are derived from a variety of residual materials including slates, granites, gneisses, and schists. They have clayey subsurface horizons, sometimes with coarse fragments or gravels, are moderate water suppliers, and are well to moderately well drained.

(Y) Soils representing upland landscapes in both mountainous and Piedmont regions. They range from shallow to moderately deep and have formed from the residuum of weathered limestones, shales, or other carbonate influenced rocks. They have clayey subsurface horizons, sometimes with coarse fragments, and are moderate to low water suppliers where shallow to bedrock. They are mostly well drained.

(Z) Soils formed in alluvium or colluvium and are in low lying terrace positions. All the physiographic provinces in Virginia are represented by one or more soils of this group. They are deep soils with clayey subsurface horizons, are moderately high water suppliers, and are somewhat poorly drained.

(AA) Upland soils, formed from a variety of sediments with the resulting soils ranging from deep to shallow. They have clayey subsurface horizons, sometimes with coarse fragments, and as a result are moderately low in water supplying capacity. They range from somewhat poorly to moderately well drained.

(BB) Soils representing upland, terrace, or footslope landscapes in the western mountains, Piedmont, and Coastal Plains. The soils have formed from a variety of parent materials including colluvium, alluvium, and limestone residuum. The soils have fragipans that underlie silty to loamy subsurface horizons. sometimes with coarse fragments. The fragipans limit the rooting zone, thus, these soils are low to moderately low water suppliers. They are generally somewhat poorly drained.

(CC) The soils in this diverse group occur across the Piedmont and mountainous regions. They are formed from a range of parent materials that include alluvium, colluvium, and loamy saprolites. They are represented by a variety of landscapes including uplands, stream terraces and colluvial positions to bottomlands. The common soil features are moderately deep sola, clayey skeletal to coarse loamy subsurface horizons, some with as much as 70% coarse fragments, and have moderately low water supplying capacities. They are well drained.

(DD) This group of soils in the Coastal Plain have formed from loamy coastal plane sediments and local alluvium. They formed on gently sloping uplands and stream terraces. They are moderately deep soils with predominantly coarse loamy subsurface horizons, and some have arenic or very thick sandy surfaces. They have moderately low, water supplying capacities and are excessively drained.

(EE) Coastal Plains soils formed in loamy sediments, on low lying landscape positions. They are deep soils with coarse loamy to sandy subsurface horizons. Water tables are usually high in these soils during some part of the year yet the soil textures are very sandy. The drainage is poor to very poor on these soils.

(FF) Soils represented by this group extend across the Piedmont to the mountainous provinces and have formed in residual parent materials ranging from sandstone, shales, and slates, to loamy granitic saprolites, and mountain colluvium. They are on steeply dissected uplands and mountain side slopes. They are moderately shallow soils , mostly with loamy skeletal subsurface horizons that may contain 80 %, or more, coarse fragments. As a result the water supplying capacity of the soils is low to very low. The soils are well to moderately well drained.

(GG) The soils in this group of Piedmont and mountainous soils formed from cherty limestone or other residuum. They are on ridge top and side slope positions and are deep to moderately deep soils. They have loamy skeletal subsurface horizons, usually with greater that 60 % coarse fragments, are low water suppliers and are well drained.

(HH) All physiographic provinces of Virginia are represented by one or more soils from this group. They formed from loamy sediments in floodplain positions in the mountains and Piedmont to finer textured sediments in the Coastal Plain. They are moderately deep soils with fine loamy or clayey subsurface textures, have moderate water supplying capacities, and range from somewhat poorly to moderately well drained.

(II) All physiographic provinces of Virginia are represented by one or more soils from this group. The common feature is that all have formed from sandy parent materials within the Coastal Plain, or from local alluvium or colluvium of sandy origin. They range from deep, in Coastal Plain from alluvial materials, to shallow in upland positions in the mountainous and Piedmont region. They are sandy textured throughout, with little horizonation, are low to very low in water supply, and are well to moderately well drained.

(JJ) The soils in this group are from either the Piedmont or mountainous regions and have formed from a wide variety of residual parent materials ranging from sandstones, shales, and limestones, to triassic materials, phillites, and granite saprolites or schists. They are shallow soils, predominantly with loamy skeletal textures throughout, ranging from 30 to 70 % coarse fragments. They are very low water suppliers and are well drained.

(KK) Soils in this group located predominantly in the Piedmont region and have formed from a variety of residual materials including triassic sediments, residuum from basic rocks, and other clayey sediments. They are moderately deep soils with clayey textured subsurface horizons, commonly with large components of high shrink-swell clays. They are moderate water suppliers and range from moderately well to somewhat poorly drained.

(LL) Soils found mostly in the Coastal Plain region, have formed from clayey sediments or formed from saprolites over basic rocks, and are on low coastal plain landscapes or gently sloping piedmont uplands. They are deep soils with clayey subsurface textures throughout. They are moderate water suppliers, and are somewhat poorly to poorly drained.

(MM) Soils located on floodplains in the Coastal Plain, formed from loamy sediments, flood frequently, have moderate to high water supplying capacity and are poorly drained.

(NN) These are the undrained soils that are listed in group "H". They are predominantly in the mountainous and western Piedmont region and have formed in alluvium along streams or on terraces. They are moderately deep, have silty to clay loam subsurface textures, are moderately high water suppliers, and are somewhat poorly to poorly drained.

(OO) These are the undrained soils that are listed in group "C". They are formed from alluvium or coastal plain sediments, on terraces, levees, and broad nearly level landscapes in the Coastal Plain. They have loamy to silty textures throughout, have high water supplying capacities, and are poorly drained.

(PP) Soils found within the Coastal Plain, and are represented by the marshes and tidal wetlands. They formed in depressions, tidal basins, tidal flats, and other ponded areas. Some have organic horizons, some have clayey mineral horizons, and some have sulfidic materials. They have water tables at or near the soil surface, and are saturated most of the time.

(QQ) The soils in this group represent the coastal sand dunes of the tidewater area. They are deep, extremely sandy, have low water supplying capacity, and are excessively drained.

Table A2 . Soil Management Groups and Productivity Estimates

SOIL MANAGEMENT GROUP	SOILS	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
		- - - YIELD POTENTIAL, Bu/A - - -						
A *	Bermudian, Buckton, Chagrin, Chagrin variant, Codorus, Codorus variant, Comus, Congaree, Elk, French, Greendale, Grigsby, Huntington, Lindside, Lobdell, Margo, Massanetta, Nolin, Pope, Ross, Rowland, Staser, Suches, Tioga, Tuckahoe, Weaver, Wheeling	160	50	40	64	80	100	115
B	Altavista, Delanco, McQueen, Pamunkey, Pamunkey variant, Sequatchie, State (Mainland), Wickham, Wickham variant	160	50	40	64	80	100	115
C (DRAINED)	Acredale, Aden, Bayboro, Bethera, Bladen, Cape Fear, Chapanoke, Chatuge, Daleville, Deloss, Elkton, Hyde, Johns, Johns variant, Kinkora, Kinston, Leaf, Lumbee, Lumbee variant, Meggett, Myatt, Myatt variant, Orrville, Orrville variant, Othello, Pantego, Pasquotank, Pooler variant, Portsmouth, Rains, Tomotley, Toxaway, Wahee, Weeksville, Yemassee	150	45	40	56	70	70	88
D	Chester, Chester Loam, Fairfax, Manassas, Myersville, Purcellville, Sudley	150	45	40	64	80	100	115
E	Alticrest, Barclay, Dragston, Fallsington, Lynchburg, Nimmo, Osier, Pocomoke, Torhunta, Weston	140	40	34	64	80	100	115
FIuka, Linden, Munden, Nansemond, Stough		140	40	34	64	80	100	115
G *	Abell, Abell variant, Cotaco, Cotaco variant, Duffield, Emory, Meadowville, Meadowville variant, Murrill, Riverview, Seneca, Shouns, Slabtown, Starr, Timberville, Timberville variant, Tusquitee	140	40	34	64	80	100	115
H * (DRAINED)	Dunning, Lickdale, Melvin, Newark, Newark variant, Philo, Purdy, Roanoke	140	40	34	48	60	60	75
I	Bowmansville, Cartecay, Chenneby, Chewacla, Mantachie, Monacan	140	40	34	64	80	100	115

J	Bertie, Bleakhill, Bolling, Bolling variant, Goldsboro, Izagora, Mount Lucas, Woodstown, Wrightsboro	130	40	32	64	80	100	115
K	Ackwater, Dogue, Duplin, Keyport, Marumsco, Mattapex, Slagle, Tetotum, Tetotum variant, Yeopim, Zoar	130	40	32	64	80	100	115

SOIL MANAGEMENT GROUP	SOILS	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
		- - - YIELD POTENTIAL, Bu/A - - -						
L *	Allegheny, Birdsboro, Clifton, Edneytown, Elsinboro, Evard, Hayter, Masada, Shelocta, Shelocta variant, Thurmont, Unison, Unison variant, Waynesboro	130	40	32	64	80	100	115
M *	Athol, Bolton, Decatur, Edom, Elliber, Frederick, Frederick/Lodi, Groseclose, Guernsey, Hagerstown, Hublersburg, Lodi, Lowell, Maury, Pisgah, Poplimento, Swimley, Vertrees	130	40	32	64	80	100	115
N	Cullen, Davidson, Eubanks, Fauquier, Glenelg(BRH), Lloyd, Lloyd variant, Minnieville, Montalto, Rabun, Rapidan	130	40	32	64	80	100	115
O	Appomattox, Austinville, Braddock, Dyke, Hiwassee, Hiwassee variant, Nolichucky, Shenval, Starr-Dyke, Turbeville	130	40	32	64	80	100	115
2 P * (DRAINED)	Augusta, Augusta variant, Dunbar, Fork, Fork variant, McGary, Tygart	130	40	32	56	70	70	88
Q	Atlee, Dothan, Freemanville, Montross, Tifton, Varina, Vaucluse	120	40	30	56	70	70	88
R	Aycock, Bama, Cahaba, Emporia, Faceville, Granville, Marlboro, Matapeake, Mattaponi, Norfolk, Orangeburg, Quantico	120	40	30	56	70	70	88
S	Kalmia, Kempsville, Ruston	120	40	30	56	70	70	88
T	Aura, Bojac(ES, VA Beach, Ches.), Dumfries, Edneyville, Eunola, Gritney, Marr, Sassafras, State (ES), Suffolk	110	40	30	56	70	70	88
U *	Arcola, Bookwood, Brecknock, Bucks, Clymer, Faywood, Fletcher, Frankstown, Gilpin, Gilpin variant, Glenelg(NV), Halewood, Jefferson, Jefferson variant, Leck Kill, Panorama, Rayne, Sequoia, Totier, Trappist, Webbtown, Westmoreland, Whiteford	110	40	30	56	70	70	88
V	Appling, Brockroad, Buckhall, Chesterfield, Gundy, Gunstock, Hanceville, Herndon,	100	35	25	56	70	70	88

	Legore, Mayodan, Mecklenburg, Mecklenburg variant, Nason, Spotsylvania, Watauga Wedowee							
W *	Aldino, Ardilla, Clarksburg, Ernest, Glenville, Laidig, Landisburg, Malbis, Marbie, Meckesville, Monongahela, Raritan, Readington, Savannah, Trego	100	35	25	40	50	50	63

SOIL MANAGEMENT GROUP	SOILS	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
		- - - YIELD POTENTIAL, Bu/A - - -						
X	Catharpin, Cecil, Culpeper, Elioak, Georgeville, Grover, Gwinnett variant, Hayesville, Madison, Pacolet, Rion, Stoneville, Tatum, Wadesboro, Yadkin	100	35	25	56	70	70	88
Y *	Bland, Caneyville, Carbo, Dulles, Endcav, Enon, Fluvanna, Oaklet, Pagebrook, Vance, Zion, Zion variant	100	35	25	48	60	60	75
Z * (UNDRAINED)	Augusta, Augusta variant, Dunbar, Fork, Fork variant, McGary, Tygart	100	35	25	40	50	50	63
AA	Angie, Angie variant, Caroline, Christian, Christiana, Lunt	100	35	25	56	70	70	88
BB *	Airmont, Beltsville, Belvoir, Bourne, Bourne variant, Buchanan, Burketown, Burrowsville, Calverton, Captina, Colfax, Colfax variant, Goldvein, Hoadley, Leadvale, Neabsco, Nicholson, Nixa, Rohrersville, York	85	25	18	48	60	60	75
CC *	Craigsville, Durham, Edgehill, Edgehill variant, Hartsells, Hawksbill, Lewisburg, Matneflat, Rigley, Sherando	85	25	18	56	70	70	88
DD *	Bojac(Mainland, excluding VA Beach & Ches.), Bonneau, Conetoe, Kenansville, Kenansville variant, Lucy, McLaurin, Occoquan, Pocalla, Remlik, Rumford, Saffell, Uchee, Wagram	85	25	18	56	70	70	88
EE	Arapahoe, Bibb, Chavies, Chavies variant, Chipley, Corolla, Klej, Lakehurst, Pactolus, Plummer, Seabrook, Seagate, Woodington	85	25	18	48	60	60	75
FF *	Alamance, Ashlar, Ayersville, Blairton, Brandywine, Brentsville, Burton, Cardiff, Dekalb, Drall, Gaila, Gainesboro, Hartleton, Lansdale, Laroque, Lew, Lily, Louisburg, Manor, Needmore, Oakhill, Oatlands, Penn, Poindexter, Poindexter variant, Porters, Rushtown, Sekil, Spivey, Stumptown, Sweetapple, Wateree	85	25	18	48	60	60	75
GG	Bailegap, Clarksville, Grimsley, Parker, Poynor, Summers, Weverton	85	25	18	40	50	50	63

HH *	Atkins, Baile, Blago, Craven, Hatboro, Nevarc, Partlow, Peawick, Toddstav, Worsham, Worsham variant	85	25	18	48	60	60	75
II *	Alaga, Biltmore, Buncombe, Catpoint, Evesboro, Galestown, Lakeland, Lakin, Leetonia, Leon, Lewisberry, Millrock, Molena, Ochlockonee, Ochlockonee variant, Schaffenaker, Tarboro, Toccoa, Wakulla, Westphalia	65	20	15	48	60	60	75

SOIL MANAGEMENT GROUP	SOILS	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
		- - - YIELD POTENTIAL, Bu/A - - -						
JJ *	Albemarle, Ashe, Berks, Bremo, Buckingham, Calvin, Cataska, Catlett, Catoctin, Chilhowie, Clearbrook, Corydon, Dandridge, Goldston, Hazel, Hazleton, Klinesville, Lehew, Litz, Louisa, Louisa variant, Manteo, Misenheimer, Nestoria, Newbern, Opequon, Pinkston, Ramsey, Reaville, Spray, Spriggs, Steinsburg, Talladega, Tallapoosa, Tallapoosa variant, Wallen, Watt, Watt variant, Weikert, Wilkes, Wurno	65	20	15	40	50	50	63
KK	Albano, Creedmoor, Creedmoor variant, Haymarket, Helena, Iredell, Iredell variant, Jackland, Kelly, Leaksville, Library, Orange, Orange variant, Orenda, Sedgefield, Susquehanna, Sycoline, Trenholm, White Store, White Store variant	65	20	15	24	30	30	38
LL	Chastain, Chickahominy, Coxville, Croton, Elbert, Elbert variant, Evansham, Forestdale, Hollywood, Lenoir, Lignum, Newflat, Okeetee, Pouncey, Robertsville, Stanton, Waxpool	65	20	15	24	30	30	38
MM	Muckalee, Wehadkee	65	20	15	24	30	30	38
NN * (UNDRAINED)	Dunning, Lickdale, Melvin, Newark, Newark variant, Philo, Purdy, Roanoke	65	20	15	24	30	30	38
OO (UNDRAINED)	Acredale, Aden, Bayboro, Bethera, Bladen, Cape Fear, Chapanoke, Chatuge, Daleville, Deloss, Elkton, Hyde, Johns, Johns variant, Kinkora, Kinston, Leaf, Lumbee, Lumbee variant, Meggett, Myatt, Myatt variant, Orrville, Orrville variant, Othello, Pantego, Pasquotank, Pooler variant, Portsmouth, Rains, Tomotley, Toxaway, Wahee, Weeksville, Yemassee	65	20	15	24	30	30	38
PP	Argent, Axis, Backbay, Belhaven, Bohicket, Camocca, Carteret, Chincoteague, Dawhoo, Dawhoo variant, Dorovan, Featherstone, Johnston, Lanexa, Levy, Magotha, Mattamuskeet, Mattan, Nawney, Pamlico, Pocaty, Pungo, Rappahanock	65	20	15	24	30	30	38
QQ	Assateague, Duckston, Fisherman, Fripp, Newhan	65	20	15	24	30	30	38

* Length of growing season for some soils in this group may not be favorable for reaching the yield goal for soybean.

Table A3. Soil Productivity Groups vs. Soil Management Groups for Corn Grain

Soil Management Groups	Soil Productivity Groups	Realistic Yield, Bu/A
A, B	Ia	160
C, D	Ib	150
E, F, G, H, I	IIa	140
J, K, L, M, N, O, P	IIb	130
Q, R, S	IIIa	120
T, U	IIIb	110
V, W, X, Y, Z, AA	IVa	100
BB, CC, DD, EE, FF, GG, HH	IVb	85
II, JJ, KK, LL, MM, NN, OO, PP, QQ	V	65

Table A4. Soil Productivity Groups vs. Soil Management Groups for Intensive Wheat

Soil Management Groups	Soil Productivity Groups	Realistic Yield, Bu/A
A, B, D, E, F, G, I, J, K, L, M, N, O	I	80
C, P, Q, R, S, T, U, V, X, CC, DD	II	70
H, Y, BB, EE, FF, HH, II	III	60
W, Z, GG, JJ	IV	50
KK, LL, MM, NN, OO, PP, QQ	V	30

Table A5. Soil Productivity Groups vs. Soil Management Groups for Canola

Soil Management Groups	Soil Productivity Groups	Realistic Yield, Bu/A
A, B, C, D, F	I	70 +
J, K, L, M, N, O, Q, R, S, T, U	II	60 - 70
V, X, Y, DD	III	50 - 60
G, W, Z, BB, CC, FF, GG, II, JJ	IV	40 - 50
C, E, P, AA	Va	*
H, I, EE, HH, KK, LL, MM, NN, OO, PP, QQ	Vb	**

* These are somewhat poorly drained soil. In some years, excess water will result in serious stand and subsequent yield reductions. In years when this is not a problem, yields will be good.

** Not suited, too wet.

Table A6. Soil Productivity Groups vs. Soil Management Groups for Alfalfa and Alfalfa-Orchardgrass Hay

Soil Management Groups	Soil Productivity Groups	Realistic Yield, T/A
A, D, M	I	> 6 T/A
B, G, N, O	II	4-6 T/A
F, K, L, R, U, V, X	III	<4 T/A
C, E, H, I, J, EE, HH, S, T, DD, GG, II, Q, W, BB, Y, AA, KK, CC, FF, JJ	IV - V	Not Suited: Too Wet Droughty Fragipans Claypan Shallow Profiles

Table A7. Soil Productivity Groups vs. Soil Management Groups for Tall Grass-Clover Hay

Soil Management Groups	Soil Productivity Groups	Realistic Yield, Bu/A
A, B, C, D, G, I, J, K	I	>4.0 T/A
E, F, L, M, N, O, R, U	II	3.5-4.0 T/A
Q, S, T, V, X, Y, BB, CC, DD, FF, GG	III	3.0-3.5 T/A
H, P, W, AA, HH, JJ, KK, LL, MM	IV	<3.0 T/A
Z, EE, NN, OO, PP, II, QQ	---	Not Suited: Too Wet Too Dry

Table A8. Soil Productivity Groups vs. Carrying Capacity for Pasture

Soil Productivity Groups	Acres per Animal Unit* Required for April 1-October 31
I	1.0
II	1.1-1.5
III	1.6-3.0
IV, V	3.1-6.5

* Animal Unit (AU) - one 1000 lb. cow and her calf
or two 500 lb. steers
or five ewes with lambs

Table A9. Soil Productivity Groupings for Various Cropping Categories

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Abell	G	IIa	IIa	I	II	IV	II	I
Abell variant	G	IIa	IIa	I	II	IV	II	I
Ackwater	K	IIb	IIb	I	II	II	III	I
Acredale (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Acredale (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Aden (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Aden (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Airmont	BB	IVb	IVb	III	IV	IV	NS*	III
Alaga	II	V	V	III	V	IV	NS*	NS*
Alamance	FF	IVb	IVb	III	IV	IV	NS*	III
Albano	KK	V	V	V	V	Vb	NS*	IV
Albemarle	JJ	V	V	IV	V	IV	NS*	IV
Aldino	W	IVa	IVa	IV	III	IV	NS*	IV
Allegheny	L	IIb	IIb	I	II	II	III	II
Altavista	B	Ia	Ia	I	Ia	I	II	I
Alticrest	E	IIa	IIa	I	II	Va	NS*	II
Angie	AA	IVa	IVa	II	III	Va	NS*	IV
Angie variant	AA	IVa	IVa	II	III	Va	NS*	IV
Appling	V	IVa	IVa	II	III	III	III	III
Appomattox	O	IIb	IIb	I	II	II	II	II
Arapahoe	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Arcola	U	IIIb	IIIb	II	II	II	III	II
Ardilla	W	IVa	IVa	IV	IIIa	IV	NS*	IV
Argent	PP	V	V	V	V	Vb	NS*	NS*
Ashe	JJ	V	V	IV	V	IV	NS*	IV
Ashlar	FF	IVb	IVb	III	IV	I	NS*	III
Assateague	QQ	V	V	V	V	Vb	NS*	NS*
Athol	M	IIb	IIb	I	II	II	I	II
Atkins	HH	IVb	IVb	III	IV	Vb	NS*	IV
Atlee	Q	IIIa	IIIa	II	II	II	NS*	III
Augusta (drained)	P	IIb	IIb	II	II	Va	NS*	III
Augusta (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Augusta variant (drained)	P	IIb	IIb	II	II	Va	NS*	III
Augusta variant (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Aura	T	IIIb	IIIb	II	II	II	NS*	III
Austinville	O	IIb	IIb	I	II	II	II	II
Axis	PP	V	V	V	V	Vb	NS*	NS*

Aycock	R	IIIa	IIIa	II	II	II	III	II
Ayersville	FF	IVb	IVb	III	IV	IV	NS*	III
Backbay	PP	V	V	V	V	Vb	NS*	NS*
Baile	HH	IVb	IVb	III	IV	Vb	NS*	IV
Bailegap	GG	IVb	IVb	IV	IV	IV	NS*	III
Bama	R	IIIa	IIIa	II	II	II	III	II
Barclay	E	IIa	IIa	I	II	Va	NS*	II
Bayboro (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Bayboro (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Belhaven	PP	V	V	V	V	Vb	NS*	NS*
Beltsville	BB	IVb	IVb	III	IV	IV	NS*	III
Belvoir	BB	IVb	IVb	III	IV	IV	NS*	III
Berks	JJ	V	V	IV	V	IV	NS*	IV
Bermudian	A	Ia	Ia	I	Ia	I	I	I

	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Soil Series								
Bertie	J	IIb	IIb	II	II	II	NS*	I
Bethera (drained)	C	Ib	Ib	I	Ib	I	NS*	I
Bethera (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Bibb	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Biltmore	II	V	V	III	V	IV	NS*	NS*
Birdsboro	L	IIb	IIb	I	II	II	III	II
Bladen (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Bladen (undrained)	OO	V	V	V	V	Vb	NS*	NS
Blago	HH	IVb	IVb	III	IV	Vb	NS*	IV
Blairton	FF	IVb	IVb	III	IV	IV	NS*	III
Bland	Y	IVa	IVa	III	III	III	NS*	III
Bleakhill	J	IIb	IIb	I	II	II	NS*	I
Bohicket	PP	V	V	V	V	Vb	NS*	NS*
Bojac (ES, VA Beach, Ches.)	T	IIIb	IIIb	II	II	II	NS*	III
Bojac (Mainland, excluding VA Beach & Ches.)	DD	IVb	IVb	II	IV	III	NS*	III
Bolling	J	IIb	IIb	I	II	II	NS*	I
Bolling variant	J	IIb	IIb	I	II	II	NS*	I
Bolton	M	IIb	IIb	I	II	II	I	II
Bonneau	DD	IVb	IVb	II	IV	III	NS*	III
Bookwood	U	IIIb	IIIb	II	II	II	III	II
Bourne	BB	IVb	IVb	III	IV	IV	NS*	III
Bourne variant	BB	IVb	IVb	III	IV	IV	NS*	III
Bowmansville	I	IIa	IIa	I	II	Vb	NS*	I
Braddock	O	IIb	IIb	I	II	II	II	II
Brandywine	FF	IVb	IVb	III	IV	IV	NS*	III
Brecknock	U	IIIb	IIIb	II	II	II	III	II
Bremo	JJ	V	V	IV	V	IV	NS*	IV
Brentsville	FF	IVb	IVb	III	IV	IV	NS*	III
Brockroad	V	IVa	IVa	II	III	III	III	III
Buchanan	BB	IVb	IVb	III	IV	IV	NS*	III
Buckhall	V	IVa	IVa	II	III	III	III	III
Buckingham	JJ	V	V	IV	V	IV	NS*	IV
Bucks	U	IIIb	IIIb	II	II	II	III	II
Buckton	A	Ia	Ia	I	Ia	I	I	I
Buncombe	II	V	V	III	V	IV	NS*	NS*
Burketown	BB	IVb	IVb	III	IV	IV	NS*	III
Burrowsville	BB	IVb	IVb	III	IV	IV	NS*	III
Burton	FF	IVb	IVb	III	IV	IV	NS*	III
Cahaba	R	IIIa	IIIa	II	II	II	III	II

Calverton	BB	IVb	IVb	III	IV	IV	NS*	III
Calvin	JJ	V	V	IV	V	IV	NS*	IV
Camocca	PP	V	V	V	V	Vb	NS*	NS*
Caneyville	Y	IVa	IVa	III	III	III	NS*	III
Cape Fear (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Cape Fear (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Captina	BB	IVb	IVb	III	IV	IV	NS*	III
Carbo	Y	IVa	IVa	III	III	III	NS*	III
Cardiff	FF	IVb	IVb	III	IV	IV	NS*	III
Caroline	AA	IVa	IVa	II	III	Va	NS*	IV
Cartecay	I	IIa	IIa	I	II	Vb	NS*	I
Carteret	PP	V	V	V	V	Vb	NS*	NS*
Cataska	JJ	V	V	IV	V	IV	NS*	IV
Catharpin	X	IVa	IVa	II	III	III	III	II
Catlett	JJ	V	V	IV	V	IV	NS*	IV

	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Soil Series								
Catoctin	JJ	V	V	IV	V	IV	NS*	IV
Catpoint	II	V	V	III	V	IV	NS*	NS*
Cecil	X	IVa	IVa	II	III	III	III	II
Chagrin	A	Ia	Ia	I	Ia	I	I	I
Chagrin variant	A	Ia	Ia	I	Ia	I	I	I
Chapanoke (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Chapanoke (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Chastain	LL	V	V	V	V	Vb	NS*	IV
Chatuge (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Chatuge (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Chavies	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Chavies variant	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Chenneby	I	IIa	IIa	I	II	Vb	NS*	I
Chester	D	Ib	Ib	I	Ib	I	I	I
Chesterfield	V	IVa	IVa	II	III	III	III	III
Chester Loam	D	Ia	Ia	I	Ia	I	I	I
Chewacla	I	IIa	IIa	I	II	Vb	NS*	I
Chickahominy	LL	V	V	V	V	Vb	NS*	IV
Chilhowie	JJ	V	V	IV	V	IV	NS*	IV
Chincoteague	PP	V	V	V	V	Vb	NS*	NS*
Chipley	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Christian	AA	IVa	IVa	II	III	Va	NS*	IV
Christiana	AA	IVa	IVa	II	III	Va	NS*	IV
Clarksburg	W	IVa	IVa	IV	III	IV	NS*	IV
Clarksville	GG	IVb	IVb	IV	IV	IV	NS*	III
Clearbrook	JJ	V	V	IV	V	IV	NS*	IV
Clifton	L	IIb	IIb	I	II	II	III	II
Clymer	U	IIIb	IIIb	II	II	II	III	II
Codorus	A	Ia	Ia	I	Ia	I	I	I
Codorus variant	A	Ia	Ia	I	Ia	I	I	I
Colfax	BB	IVb	IVb	III	IV	IV	NS*	III
Colfax variant	BB	IVb	IVb	III	IV	IV	NS*	III
Comus	A	Ia	Ia	I	Ia	I	I	I
Conetoe	DD	IVb	IVb	II	IV	III	NS*	III
Congaree	A	Ia	Ia	I	Ia	I	I	I
Corolla	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Corydon	JJ	V	V	IV	V	IV	NS*	IV
Cotaco	G	IIa	IIa	I	II	IV	II	I
Cotaco variant	G	IIa	IIa	I	II	IV	II	I
Coxville	LL	V	V	V	V	Vb	NS*	IV

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Craigsville	CC	IVb	IVb	II	IV	IV	NS*	III
Craven	HH	IVb	IVb	III	IV	Vb	NS*	IV
Creedmoor	KK	V	V	V	V	Vb	NS*	IV
Creedmoor variant	KK	V	V	V	V	Vb	NS*	IV
Croton	LL	V	V	V	V	Vb	NS*	IV
Cullen	N	IIb	IIb	I	II	II	II	II
Culpeper	X	IVa	IVa	II	III	III	III	II
Daleville (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Daleville (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Dandridge	JJ	V	V	IV	V	IV	NS*	IV
Davidson	N	IIb	IIb	I	II	II	II	II
Dawhoo	PP	V	V	V	V	Vb	NS*	NS*
Dawhoo variant	PP	V	V	V	V	Vb	NS*	NS*
Decatur	M	IIb	IIb	I	II	II	I	II
Dekalb	FF	IVb	IVb	III	IV	IV	NS*	III
Delanco	B	Ia	Ia	I	Ia	I	II	I
Deloss (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Deloss (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Dogue	K	IIb	IIb	I	II	II	III	I
Dorovan	PP	V	V	V	V	Vb	NS*	NS*
Dothan	Q	IIb	IIb	II	II	II	NS*	III
Dragston	E	IIa	IIa	I	II	Va	NS*	II
Drall	FF	IVb	IVb	III	IV	IV	NS*	III
Duckston	QQ	V	V	V	V	Vb	NS*	NS*
Duffield	G	IIa	IIa	I	II	IV	II	I
Dulles	Y	IVa	IVa	III	III	III	NS*	III
Dumfries	T	IVa	IVa	II	II	II	NS*	III
Dunbar (drained)	P	IIb	IIb	II	II	Va	NS*	III
Dunbar (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Dunning (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Dunning (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Duplin	K	IIb	IIb	I	II	II	III	I
Durham	CC	IVb	IVb	II	IV	IV	NS*	III
Dyke	O	IIIb	IIIb	I	II	II	II	II
Edgehill	CC	IVb	IVb	II	IV	IV	NS*	III
Edgehill variant	CC	IVb	IVb	II	IV	IV	NS*	III
Edneytown	L	IIb	IIb	I	II	II	III	II
Edneyville	T	IIIb	IIIb	II	II	II	NS*	III
Edom	M	IIb	IIb	I	II	II	I	II
Elbert	LL	V	V	V	V	Vb	NS*	IV
Elbert variant	LL	V	V	V	V	Vb	NS*	IV
Elioak	X	IVa	IVa	II	III	III	III	II

Elk	A	Ia	Ia	I	Ia	I	I	I
Elkton (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Elkton (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Elliber	M	IIb	IIb	I	II	II	I	II
Elsinboro	L	IIb	IIb	I	II	II	III	II
Emory	G	IIa	IIa	I	II	IV	II	I
Emporia	R	IIIa	IIIa	II	II	II	III	II
Endcav	Y	IVa	IVa	III	III	III	NS*	III
Enon	Y	IVa	IVa	III	III	III	NS*	III
Ernest	W	IVa	IVa	IV	III	IV	NS*	IV
Eubanks	N	IIb	IIb	I	II	II	II	II
Eunola	T	IIIb	IIIb	II	II	II	NS*	III
Evansham	LL	V	V	V	V	Vb	NS*	IV
Evard	L	IIb	IIb	I	II	II	III	II
Evesboro	II	V	V	III	V	IV	NS*	NS*
Faceville	R	IIIa	IIIa	II	II	II	III	II
Fairfax	D	Ib	Ib	I	Ib	I	I	I
Fallsington	E	IIa	IIa	I	II	Va	NS*	II
Fauquier	N	IIb	IIb	I	II	II	II	II
Faywood	U	IIIb	IIIb	II	II	II	III	II
Featherstone	PP	V	V	V	V	Vb	NS*	NS*
Fisherman	QQ	V	V	V	V	Vb	NS*	NS*
Fletcher	U	IIIb	IIIb	II	II	II	III	II
Fluvanna	Y	IVa	IVa	III	III	III	NS*	III
Forestdale	LL	V	V	V	V	Vb	NS*	IV
Fork (drained)	P	IIb	IIb	II	II	Va	NS*	III
Fork (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Fork variant (drained)	P	IIb	IIb	II	II	Va	NS*	III

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Fork variant (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Frankstown	U	IIIb	IIIb	II	II	II	III	II
Frederick	M	IIb	IIb	I	II	II	I	II
Frederick/Lodi	M	IIb	IIb	I	II	II	I	II
Freemanville	Q	IIIa	IIIa	II	II	II	NS*	III
French	A	Ia	Ia	I	Ia	I	I	I
Fripp	QQ	V	V	V	V	Vb	NS*	NS*
Gaila	FF	IVb	IVb	III	IV	IV	NS*	III
Gainesboro	FF	IVb	IVb	III	IV	IV	NS*	III
Galestown	II	V	V	III	V	IV	NS*	NS*
Georgeville	X	IVa	IVa	II	III	III	III	II
Gilpin	U	IIIb	IIIb	II	II	II	III	II
Gilpin variant	U	IIIb	IIIb	II	II	II	III	II
Glenelg(BRH)	N	IIb	IIb	I	II	II	II	II

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Glenelg(NV)	U	IIb	IIb	II	II	II	III	II
Glenville	W	IVa	IVa	IV	III	IV	NS*	IV
Goldsboro	J	IIb	IIb	I	II	II	NS*	I
Goldston	JJ	V	V	IV	V	IV	NS*	IV
Goldvein	BB	IVb	IVb	III	IV	IV	NS*	III
Granville	R	IIIa	IIIa	II	II	II	III	II
Greendale	A	Ia	Ia	I	Ia	I	I	I
Grigsby	A	Ia	Ia	I	Ia	I	I	I
Grimsley	GG	IVb	IVb	IV	IV	IV	NS*	III
Gritney	T	IVa	IVa	II	II	II	NS*	III
Groseclose	M	IIb	IIb	I	II	II	I	II
Grover	X	IVa	IVa	II	III	III	III	II
Guernsey	M	IIb	IIb	I	II	II	I	II
Gundy	V	IVa	IVa	II	III	III	III	III
Gunstock	V	IVa	IVa	II	III	III	III	III
Gwinnett variant	X	IVa	IVa	II	III	III	III	II
Hagerstown	M	IIb	IIb	I	II	II	I	II
Halewood	U	IIIb	IIIb	II	II	II	III	II
Hanceville	V	IVa	IVa	II	III	III	III	III
Hartleton	FF	IVb	IVb	III	IV	IV	NS*	III
Hartsells	CC	IVb	IVb	II	IV	IV	NS*	III
Hatboro	HH	IVb	IVb	III	IV	Vb	NS*	IV
Hawksbill	CC	IVb	IVb	II	IV	IV	NS*	III
Hayesville	X	IVa	IVa	II	III	III	III	II
Haymarket	KK	V	V	V	V	Vb	NS*	IV
Hayter	L	IIb	IIb	I	II	II	III	II
Hazel	JJ	V	V	IV	V	IV	NS*	IV
Hazleton	JJ	V	V	IV	V	IV	NS*	IV
Helena	KK	V	V	V	V	Vb	NS*	IV
Herndon	V	IVa	IVa	II	III	III	III	III
Hiwassee	O	IIb	IIb	I	II	II	II	II
Hiwassee variant	O	IIb	IIb	I	II	II	II	II
Hoadley	BB	IVb	IVb	III	IV	IV	NS*	III
Hollywood	LL	V	V	V	V	Vb	NS*	IV
Hublersburg	M	IIb	IIb	I	II	II	I	II
Huntington	A	Ia	Ia	I	Ia	I	I	I
Hyde (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Hyde (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Iredell	KK	V	V	V	V	Vb	NS*	IV
Iredell variant	KK	V	V	V	V	Vb	NS*	IV
Iuka	F	IIa	IIa	I	II	I	III	II
Izagora	J	IIb	IIb	I	II	II	NS*	I

Jackland	KK	V	V	V	V	Vb	NS*	IV
Jefferson	U	IIIb	IIIb	II	II	II	III	II
Jefferson variant	U	IIIb	IIIb	II	II	II	III	II
Johns (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Johns (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Johnston	PP	V	V	V	V	Vb	NS*	NS*
Johns variant (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Johns variant (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Kalmia	S	IIIa	IIIa	II	II	II	NS*	III
Kelly	KK	V	V	V	V	Vb	NS*	IV
Kempsville	S	IIIa	IIIa	II	II	II	NS*	III
Kenansville	DD	IVb	IVb	II	IV	III	NS*	III
Kenansville variant	DD	IVb	IVb	II	IV	III	NS*	III
Keyport	K	IIb	IIb	I	II	II	III	I
Kinkora (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Kinkora (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Kinston (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Kinston (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Klej	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Klinesville	JJ	V	V	IV	V	IV	NS*	IV
Laidig	W	IVa	IVa	IV	III	IV	NS*	IV
Lakehurst	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Lakeland	II	V	V	III	V	IV	NS*	NS
Lakin	II	V	V	III	V	IV	NS*	NS
Landisburg	W	IVa	IVa	IV	III	IV	NS*	IV
Lanexa	PP	V	V	V	V	Vb	NS*	NS*
Lansdale	FF	IVb	IVb	III	IV	IV	NS*	III
Laroque	FF	IVb	IVb	III	IV	IV	NS*	III
Leadvale	BB	IVb	IVb	III	IV	IV	NS*	III
Leaf (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Leaf (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Leaksville	KK	V	V	V	V	Vb	NS*	IV
Leck Kill	U	IIIb	IIIb	II	II	II	III	II
Leetonia	II	V	V	III	V	IV	NS*	NS*
Legore	V	IVa	IVa	II	III	III	III	III
Lehew	JJ	V	V	IV	V	IV	NS*	IV
Lenoir	LL	V	V	V	V	Vb	NS*	IV
Leon	II	V	V	III	V	IV	NS*	NS*
Levy	PP	V	V	V	V	Vb	NS*	NS*
Lew	FF	IVb	IVb	III	IV	IV	NS*	III
Lewisberry	II	V	V	III	V	IV	NS*	NS*
Lewisburg	CC	IVb	IVb	II	IV	IV	NS*	III
Library	KK	V	V	V	V	Vb	NS*	IV
Lickdale (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Lickdale (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Lignum	LL	V	V	V	V	Vb	NS*	IV
Lily	FF	IVb	IVb	III	IV	IV	NS*	III
Linden	F	IIa	IIa	I	II	I	III	II
Lindside	A	Ia	Ia	I	Ia	I	I	I
Litz	JJ	V	V	IV	V	IV	NS*	IV
Lloyd	N	IIb	IIb	I	II	II	II	II
Lloyd variant	N	IIb	IIb	I	II	II	II	II
Lobdell	A	Ia	Ia	I	Ia	I	I	I

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Lodi	M	IIb	IIb	I	II	II	I	II
Louisa	JJ	V	V	IV	V	IV	NS*	IV
Louisa variant	JJ	V	V	IV	V	IV	NS*	IV
Louisburg	FF	IVb	IVb	III	IV	IV	NS*	III
Lowell	M	IIb	IIb	I	II	II	I	II
Lucy	DD	IVb	IVb	II	IV	III	NS*	III
Lumbee (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Lumbee (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Lumbee variant (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Lumbee variant (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Lunt	AA	IVa	IVa	II	III	Va	NS*	IV
Lynchburg	E	IIa	IIa	I	II	Va	NS*	II
Madison	X	IVa	IVa	II	III	III	III	III
Magotha	PP	V	V	V	V	Vb	NS*	NS*
Malbis	W	IVa	IVa	IV	III	IV	NS*	IV
Manassas	D	Ib	Ib	I	Ib	I	I	I
Manor	FF	IVb	IVb	III	IV	IV	NS*	III
Mantachie	I	IIa	IIa	I	II	Vb	NS*	I
Manteo	JJ	V	V	IV	V	IV	NS*	IV
Marbie	W	IVa	IVa	IV	III	IV	NS*	IV
Margo	A	Ia	Ia	I	Ia	I	I	I
Marlboro	R	IIIa	IIIa	II	II	II	III	II
Marr	T	IIIb	IIIb	II	II	II	NS*	III
Marumsco	K	IIb	IIb	I	II	II	III	I
Masada	L	IIb	IIb	I	II	II	III	II
Massanetta	A	Ia	Ia	I	Ia	I	I	I
Matapeake	R	IIIa	IIIa	II	II	II	III	II
Matneflat	CC	IVb	IVb	II	IV	IV	NS*	III
Mattamuskeet	PP	V	V	V	V	Vb	NS*	NS*
Mattan	PP	V	V	V	V	Vb	NS*	NS*
Mattapex	K	IIb	IIb	I	II	II	III	I
Mattaponi	R	IIIa	IIIa	II	II	II	III	II
Maury	M	IIb	IIb	I	II	II	I	II
Mayodan	V	IVa	IVa	II	III	III	III	III
McGary (drained)	P	IIb	IIb	II	II	Va	NS*	III
McGary (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
McLaurin	DD	IVb	IVb	II	IV	III	NS*	III
McQueen	B	Ia	Ia	I	Ia	I	II	I
Meadowville	G	IIa	IIa	I	II	IV	II	I
Meadowville variant	G	IIa	IIa	I	II	IV	II	I
Meckesville	W	IVa	IVa	IV	III	IV	NS*	IV
Mecklenburg	V	IVa	IVa	II	III	III	III	III

Mecklenburg variant	V	IVa	IVa	II	III	III	III	III
Meggett (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Meggett (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Melvin (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Melvin (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Millrock	II	V	V	III	V	IV	NS*	NS*
Minnieville	N	IIb	IIb	I	II	II	II	II
Misenheimer	JJ	V	V	IV	V	IV	NS*	IV
Molena	II	V	V	III	V	IV	NS*	NS*
Monacan	I	IIa	IIa	I	II	Vb	NS*	I
Monongahela	W	IVa	IVa	IV	III	IV	NS*	IV
Montalto	N	IIb	IIb	I	II	II	II	II
Montross	Q	IIIa	IIIa	II	II	II	NS*	III
Mount Lucas	J	IIb	IIb	I	II	II	NS*	I

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Muckalee	MM	V	V	V	V	Vb	NS*	IV
Munden	F	IIa	IIa	I	IIa	I	III	II
Murrill	G	IIa	IIa	I	II	IV	II	I
Myatt (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Myatt (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Myatt variant (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Myatt variant (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Myersville	D	Ib	Ib	I	Ib	I	I	I
Nansemond	F	IIa	IIa	I	II	I	III	II
Nason	V	IVa	IVa	II	III	III	III	III
Nawney	PP	V	V	V	V	Vb	NS*	NS*
Neabsco	BB	IVb	IVb	III	IV	IV	NS*	III
Needmore	FF	IVb	IVb	III	IV	IV	NS*	III
Nestoria	JJ	V	V	IV	V	IV	NS*	IV
Nevarc	HH	IVb	IVb	III	IV	Vb	NS*	IV
Newark (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Newark (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Newark variant (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Newark variant (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Newbern	JJ	V	V	IV	V	IV	NS*	IV
Newflat	LL	V	V	V	V	Vb	NS*	IV
Newhan	QQ	V	V	V	V	Vb	NS*	NS*
Nicholson	BB	IVb	IVb	III	IV	IV	NS*	III
Nimmo	E	IIa	IIa	I	II	Va	NS*	II
Nixa	BB	IVb	IVb	III	IV	IV	NS*	III
Nolichucky	O	IIb	IIb	I	II	II	II	II
Nolin	A	Ia	Ia	I	Ia	I	I	I
Norfolk	R	IIIa	IIIa	II	II	II	III	II

Oakhill	FF	IVb	IVb	III	IV	IV	NS*	III
Oaklet	Y	IVa	IVa	III	III	III	NS*	III
Oatlands	FF	IVb	IVb	III	IV	IV	NS*	III
Occoquan	DD	IVb	IVb	II	IV	III	NS*	III
Ochlockonee	II	V	V	III	V	IV	NS*	NS*
Ochlockonee variant	II	V	V	III	V	IV	NS*	NS*
Okeetee	LL	V	V	V	V	Vb	NS*	IV
Opequon	JJ	V	V	IV	V	IV	NS*	IV
Orange	KK	V	V	V	V	Vb	NS*	IV
Orangeburg	R	IIIa	IIIa	II	II	II	III	II
Orange variant	KK	V	V	V	V	Vb	NS*	IV
Orenda	KK	V	V	V	V	Vb	NS*	IV
Orrville (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Orrville (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Orrville variant (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Orrville variant (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Osier	E	IIa	IIa	I	II	Va	NS*	II
Othello (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Othello (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Pacolet	X	IVa	IVa	II	III	III	III	II
Pactolus	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Pagebrook	Y	IVa	IVa	III	III	III	NS*	III
Pamlico	PP	V	V	V	V	Vb	NS*	NS*
Pamunkey	B	Ia	Ia	I	Ia	I	II	I
Pamunkey variant	B	Ia	Ia	I	Ia	I	II	I
Panorama	U	IIIb	IIIb	II	II	II	III	II
Pantego (drained)	C	Ib	Ib	II	Ib	I	NS*	I

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Pantego (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Parker	GG	IVb	IVb	IV	IV	IV	NS*	III
Partlow	HH	IVb	IVb	III	IV	Vb	NS*	IV
Pasquotank (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Pasquotank (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Peawick	HH	IVb	IVb	III	IV	Vb	NS*	IV
Penn	FF	IVb	IVb	III	IV	IV	NS*	III
Philo (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Philo (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Pinkston	JJ	V	V	IV	V	IV	NS*	IV
Pisgah	M	IIb	IIb	I	II	II	I	II
Plummer	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Pocalla	DD	IVb	IVb	II	IV	III	NS*	III
Pocaty	PP	V	V	V	V	Vb	NS*	NS*
Pocomoke	E	IIa	IIa	I	II	Va	NS*	II

Poindexter	FF	IVb	IVb	III	IV	IV	NS*	III
Poindexter variant	FF	IVb	IVb	III	IV	IV	NS*	III
Pooler variant (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Pooler variant (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Pope	A	Ia	Ia	I	Ia	I	I	I
Poplimento	M	IIb	IIb	I	II	II	I	II
Porters	FF	IVb	IVb	III	IV	IV	NS*	III
Portsmouth (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Portsmouth (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Pouncey	LL	V	V	V	V	Vb	NS*	IV
Poynor	GG	IVb	IVb	IV	IV	IV	NS*	III
Pungo	PP	V	V	V	V	Vb	NS*	NS*
Purcellville	D	Ib	Ib	I	Ib	I	I	I
Purdy (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Purdy (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Quantico	R	IIIa	IIIa	II	II	II	III	II
Rabun	N	IIb	IIb	I	II	II	II	II
Rains (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Rains (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Ramsey	JJ	V	V	IV	V	IV	NS*	IV
Rapidan	N	IIb	IIb	I	II	II	II	II
Rappahanock	PP	V	V	V	V	Vb	NS*	NS*
Raritan	W	IVa	IVa	IV	III	IV	NS*	IV
Rayne	U	IIIb	IIIb	II	II	II	III	II
Readington	W	IVa	IVa	IV	III	IV	NS*	IV
Reaville	JJ	V	V	IV	V	IV	NS*	IV
Remlik	DD	IVb	IVb	II	IV	III	NS*	III
Rigley	CC	IVb	IVb	II	IV	IV	NS*	III
Rion	X	IVa	IVa	II	III	III	III	II
Riverview	G	IIa	IIa	I	II	IV	II	I
Roanoke (drained)	H	IIa	IIa	III	II	Vb	NS*	IV
Roanoke (undrained)	NN	V	V	V	V	Vb	NS*	NS*
Robertsville	LL	V	V	V	V	Vb	NS*	IV
Rohrersville	BB	IVb	IVb	III	IV	IV	NS*	III
Ross	A	Ia	Ia	I	Ia	I	I	I
Rowland	A	Ia	Ia	I	Ia	I	I	I
Rumford	DD	IVb	IVb	II	IV	III	NS*	III
Rushtown	FF	IVb	IVb	III	IV	IV	NS*	III
Ruston	S	IIIa	IIIa	II	II	II	NS*	III
Saffell	DD	IVb	IVb	II	IV	III	NS*	III

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Sassafras	T	IVa	IVa	II	III	II	NS*	III
Savannah	W	IIIb	IIIb	IV	II	IV	NS*	IV

Schaffenaker	II	V	V	III	V	IV	NS*	NS*
Seabrook	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Seagate	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Sedgefield	KK	V	V	V	V	Vb	NS*	IV
Sekil	FF	IVb	IVb	III	IV	IV	NS*	III
Seneca	G	IIa	IIa	I	II	IV	II	I
Sequatchie	B	Ia	Ia	I	Ia	I	II	I
Sequoia	U	IIIb	IIIb	II	II	II	III	II
Shelocta	L	IIb	IIb	I	II	II	III	II
Shelocta variant	L	IIb	IIb	I	II	II	III	II
Shenval	O	IIb	IIb	I	II	II	II	II
Sherando	CC	IVb	IVb	II	IV	IV	NS*	III
Shouns	G	IIa	IIa	I	II	IV	II	I
Slabtown	G	IIa	IIa	I	II	IV	II	I
Slagle	K	IIb	IIb	I	II	II	III	I
Spivey	FF	IVb	IVb	III	IV	IV	NS*	III
Spotsylvania	V	IVa	IVa	II	III	III	III	III
Spray	JJ	V	V	IV	V	IV	NS*	IV
Spriggs	JJ	V	V	IV	V	IV	NS*	IV
Stanton	LL	V	V	V	V	Vb	NS*	IV
Starr	G	IIa	IIa	I	II	IV	II	I
Starr-Dyke	O	IIb	IIb	I	II	II	II	II
Staser	A	Ia	Ia	I	Ia	I	I	I
State (ES)	T	IIIB	IIIB	II	II	II	NS*	III
State (Mainland)	B	Ia	Ia	I	Ia	I	II	I
Steinsburg	JJ	V	V	IV	V	IV	NS*	IV
Stoneville	X	IVa	IVa	II	III	III	III	III
Stough	F	IIa	IIa	I	II	I	III	II
Stumptown	FF	IVb	IVb	III	IV	IV	NS*	III
Suches	A	Ia	Ia	I	Ia	I	I	I
Sudley	D	Ib	Ib	I	Ib	I	I	I
Suffolk	T	IIIb	IIIb	II	II	II	NS*	III
Summers	GG	IVa	IVa	IV	IV	IV	NS*	III
Susquehanna	KK	V	V	V	V	Vb	NS*	IV
Sweetapple	FF	IVb	IVb	III	IV	IV	NS*	III
Swimley	M	IIb	IIb	I	II	II	I	II
Sycoline	KK	V	V	V	V	Vb	NS*	IV
Talladega	JJ	V	V	IV	V	IV	NS*	IV
Tallapoosa	JJ	V	V	IV	V	IV	NS*	IV
Tallapoosa variant	JJ	V	V	IV	V	IV	NS*	IV
Tarboro	II	V	V	III	V	IV	NS*	NS*
Tatum	X	IVa	IVa	II	III	III	III	II
Tetotum	K	IIb	IIb	I	II	II	III	I
Tetotum variant	K	IIb	IIb	I	II	II	III	I
Thurmont	L	IIb	IIb	I	II	II	III	II
Tifton	Q	IIIa	IIIa	II	II	II	NS*	III
Timberville	G	IIa	IIa	I	II	IV	II	I
Timberville variant	G	IIa	IIa	II	II	IV	II	I
Tioga	A	Ia	Ia	I	Ia	I	I	I
Toccoa	II	V	V	III	V	IV	NS*	NS*
Toddstav	HH	IVb	IVb	III	IV	Vb	NS*	IV
Tomotley (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Tomotley (undrained)	OO	V	V	V	V	Vb	NS*	NS*

	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Soil Series								
Torhunta	E	IIa	IIa	I	II	Va	NS*	II
Totier	U	IIIb	IIIb	II	II	II	III	III
Toxaway (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Toxaway (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Trappist	U	IIIb	IIIb	II	II	II	III	II
Trego	W	IVa	IVa	IV	III	IV	NS*	IV
Trenholm	KK	V	V	V	V	Vb	NS*	IV
Tuckahoe	A	Ia	Ia	I	Ia	I	I	I
Turbeville	O	IIb	IIb	I	II	II	II	II
Tusquitee	G	IIa	IIa	I	II	IV	II	I
Tygart (drained)	P	IIb	IIb	II	II	Va	NS*	III
Tygart (undrained)	Z	IVa	IVa	IV	III	IV	NS*	NS*
Uchee	DD	IVb	IVb	II	IV	III	NS*	III
Unison	L	IIb	IIb	I	II	II	III	II
Unison variant	L	IIb	IIb	I	II	II	III	II
Vance	Y	IVa	IVa	III	III	III	NS*	III
Varina	Q	IIIa	IIIa	II	II	II	NS*	III
Vaucluse	Q	IIIa	IIIa	II	II	II	NS*	III
Vertrees	M	IIb	IIb	I	II	II	I	II
Wadesboro	X	IVa	IVa	II	III	III	III	III
Wagram	DD	IVb	IVb	II	IV	III	NS*	III
Wahee (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Wahee (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Wakulla	II	V	V	III	V	IV	NS*	NS*
Wallen	JJ	V	V	IV	V	IV	NS*	IV
Watauga	V	IVa	IVa	II	III	III	III	III
Wateree	FF	IVb	IVb	III	IV	IV	NS*	III
Watt	JJ	V	V	IV	V	IV	NS*	IV
Watt variant	JJ	V	V	IV	V	IV	NS*	IV
Waxpool	LL	V	V	V	V	Vb	NS*	IV
Waynesboro	L	IIb	IIb	I	II	II	III	II
Weaver	A	Ia	Ia	I	Ia	I	I	I
Webbtown	U	IVb	IVb	IV	IV	II	NS*	III
Wedowee	V	IVa	IVa	II	III	III	III	III
Weeksville (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Weeksville (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Wehadkee	MM	V	V	V	V	Vb	NS*	IV
Weikert	JJ	V	V	IV	V	IV	NS*	IV
Westmoreland	U	IIIb	IIIb	II	II	II	III	II
Weston	E	IIa	IIa	I	II	Va	NS*	II

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Westphalia	II	V	V	III	V	IV	NS*	NS*
Weverton	GG	IVb	IVb	IV	IV	IV	NS*	III
Wheeling	A	Ia	Ia	I	Ia	I	I	I
Whiteford	U	IIIb	IIIb	II	II	II	III	II
White Store	KK	V	V	V	V	Vb	NS*	IV
White Store variant	KK	V	V	V	V	Vb	NS*	IV
Wickham	B	Ia	Ia	I	Ia	I	II	I
Wickham variant	B	Ia	Ia	I	Ia	I	II	I
Wilkes	JJ	V	V	IV	V	IV	NS*	IV
Woodington	EE	IVb	IVb	III	IV	Vb	NS*	NS*
Woodstown	J	IIb	IIb	I	II	II	NS*	I
Worsham	HH	IVb	IVb	III	IV	Vb	NS*	IV
Worsham variant	HH	IVb	IVb	III	IV	Vb	NS*	IV
Wrightsboro	J	IIb	IIb	I	II	II	NS*	I
Wurno	JJ	V	V	IV	V	IV	NS*	IV

Soil Series	Soil Mngt. Group	Corn	Grain Sorghum	Small Grains	Soybeans	Canola	Alfalfa	Tall Grass Clover Hay, Pasture
Yadkin	X	IVa	IVa	II	III	III	III	II
Yemasse (drained)	C	Ib	Ib	II	Ib	I	NS*	I
Yemasse (undrained)	OO	V	V	V	V	Vb	NS*	NS*
Yeopim	K	IIb	IIb	I	II	II	III	I
York	BB	IVb	IVb	III	IV	IV	NS*	III
Zion	Y	IVa	IVa	III	III	III	NS*	III
Zion variant	Y	IVa	IVa	III	III	III	NS*	III
Zoar	K	IIb	IIb	I	II	II	III	I

NS* - Not suited

Note: Soil Productivity Groups were not developed for small acreage, high cash value crops such as tobacco, peanuts and vegetables because:

1.Practically all producers are familiar with those soils that are not suited for the production of these crops.

2.Although yield potentials will vary between soils, fertilizer costs make up a relatively small part of the cost of production. Therefore, adjusting fertilizer application rates to expected yields is not as economically important as it is for other crops.

3.The level of nitrogen application that will have a significant detrimental effect on crop quality is reached before there is a significant detrimental effect on water quality.

4.Practically all fields being used for the production of these crops have already been raised to medium or higher levels of soil fertility. Therefore, the objective in P and K fertilization of these crops is limited to maintenance of these fertility levels.

Table A10. Soil Yield Potentials for Various Crops

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Abell	G	140	40	34	64	80	80	100
Abell variant	G	140	40	34	64	80	80	100
Ackwater	K	130	40	32	64	80	80	100
Acredale (drained)	C	150	45	40	56	70	70	88
Acredale (undrained)	OO	65	20	15	24	30	30	38
Aden (drained)	C	150	45	40	56	70	70	88
Aden (undrained)	OO	65	20	15	24	30	30	38
Airmont	BB	85	25	18	48	60	60	75
Alaga	II	65	20	15	48	60	60	75
Alamance	FF	85	25	18	48	60	60	75
Albano	KK	65	20	15	32	40	40	50
Albemarle	JJ	65	20	15	40	50	50	63
Aldino	W	100	35	25	40	50	50	63
Allegheny	L	130	40	32	64	80	80	100
Altavista	B	160	50	40	64	90	90	113
Alticrest	E	140	40	34	64	80	80	100
Angie	AA	100	35	25	56	70	70	88
Angie variant	AA	100	35	25	56	70	70	88
Appling	V	100	35	25	56	70	70	88
Appomattox	O	130	40	32	64	80	80	100
Arapahoe	EE	85	25	18	48	60	60	75
Arcola	U	110	40	30	56	70	70	88
Ardilla	W	100	35	25	40	50	50	63
Argent	PP	65	20	15	24	30	30	38
Ashe	JJ	65	20	15	40	50	50	63
Ashlar	FF	85	25	18	48	60	60	75
Assateague	QQ	65	20	15	24	30	30	38
Athol	M	130	40	32	64	80	80	100
Atkins	HH	85	25	18	48	60	60	75
Atlee	Q	120	40	30	56	70	70	88
Augusta (drained)	P	130	40	32	56	70	70	88
Augusta (undrained)	Z	100	35	25	40	50	50	63
Augusta variant (drained)	P	130	40	32	56	70	70	88
Augusta variant (undrained)	Z	100	35	25	40	50	50	63
Aura	T	110	40	30	56	70	70	88
Austinville	O	130	40	32	64	80	80	100
Axis	PP	65	20	15	24	30	30	38
Aycock	R	120	40	30	56	70	70	88
Ayersville	FF	85	25	18	48	60	60	75
Backbay	PP	65	20	15	24	30	30	38
Baile	HH	85	25	18	48	60	60	75
Bailegap	GG	85	25	18	40	50	50	63
Bama	R	120	40	30	56	70	70	88
Barclay	E	140	40	34	64	80	80	100
Bayboro (drained)	C	150	45	40	56	70	70	88

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Bayboro (undrained)	OO	65	20	15	24	30	30	38
Belhaven	PP	65	20	15	24	30	30	38
Beltsville	BB	85	25	18	48	60	60	75
Belvoir	BB	85	25	18	48	60	60	75
Berks	JJ	65	20	15	40	50	50	63
Bermudian	A	160	50	40	64	80	80	100
Bertie	J	130	40	32	64	80	80	100
Bethera (drained)	C	150	45	40	56	70	70	88
Bethera (undrained)	OO	65	20	15	24	30	30	38
Bibb	EE	85	25	18	48	60	60	75
Biltmore	II	65	20	15	48	60	60	75
Birdsboro	L	130	40	32	64	80	80	100
Bladen (drained)	C	150	45	40	56	70	70	88
Bladen (undrained)	OO	65	20	15	24	30	30	38
Blago	HH	85	25	18	48	60	60	75
Blairton	FF	85	25	18	48	60	60	75
Bland	Y	100	35	25	48	60	60	75
Bleakhill	J	130	40	32	64	80	80	100
Bohicket	PP	65	20	15	24	30	30	38
Bojac (ES, VA Beach, Ches.)	T	110	40	30	56	70	70	88
Bojac (Mainland, excluding VA Beach & Ches.)	DD	85	25	18	56	70	70	88
Bolling	J	130	40	32	64	80	80	100
Bolling variant	J	130	40	32	64	80	80	100
Bolton	M	130	40	32	64	80	80	100
Bonneau	DD	85	25	18	56	70	70	88
Bookwood	U	110	40	30	56	70	70	88
Bourne	BB	85	25	18	48	60	60	75
Bourne variant	BB	85	25	18	48	60	60	75
Bowmansville	I	140	40	34	64	80	80	100
Braddock	O	130	40	32	64	80	80	100
Brandywine	FF	85	25	18	48	60	60	75
Brecknock	U	110	40	30	56	70	70	88
Bremo	JJ	65	20	15	40	50	50	63
Brentsville	FF	85	25	18	48	60	60	75
Brockroad	V	100	35	25	56	70	70	88
Buchanan	BB	85	25	18	48	60	60	75
Buckhall	V	100	35	25	56	70	70	88
Buckingham	JJ	65	20	15	40	50	50	63
Bucks	U	110	40	30	56	70	70	88
Buckton	A	160	50	40	64	80	80	100
Buncombe	II	65	20	15	48	60	60	75
Burketown	BB	85	25	18	48	60	60	75
Burrowsville	BB	85	25	18	48	60	60	75
Burton	FF	85	25	18	48	60	60	75
Cahaba	R	120	40	30	56	70	70	88
Calverton	BB	85	25	18	48	60	60	75
Calvin	JJ	65	20	15	40	50	50	63

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Camocca	PP	65	20	15	24	30	30	38
Caneyville	Y	100	35	25	48	60	60	75
Cape Fear (drained)	C	150	45	40	56	70	70	88
Cape Fear (undrained)	OO	65	20	15	24	30	30	38
Captina	BB	85	25	18	48	60	60	75
Carbo	Y	100	35	25	48	60	60	75
Cardiff	FF	85	25	18	48	60	60	75
Caroline	AA	100	35	25	56	70	70	88
Cartecay	I	140	40	34	64	80	80	100
Carteret	PP	65	20	15	24	30	30	38
Cataska	JJ	65	20	15	40	50	50	63
Catharpin	X	100	35	25	56	70	70	88
Catlett	JJ	65	20	15	40	50	50	63
Catoctin	JJ	65	20	15	40	50	50	63
Catpoint	II	65	20	15	48	60	60	75
Cecil	X	100	35	25	56	70	70	88
Chagrin	A	160	50	40	64	80	80	100
Chagrin variant	A	160	50	40	64	80	80	100
Chapanoke (drained)	C	150	45	40	56	70	70	88
Chapanoke (undrained)	OO	65	20	15	24	30	30	38
Chastain	LL	65	20	15	24	30	30	38
Chatuge (drained)	C	150	45	40	56	70	70	88
Chatuge (undrained)	OO	65	20	15	24	30	30	38
Chavies	EE	85	25	18	48	60	60	75
Chavies variant	EE	85	25	18	48	60	60	75
Chenneby	I	140	40	34	64	80	80	100
Chester	D	150	45	40	64	80	80	100
Chesterfield	V	100	35	25	56	70	70	88
Chester Loam	D	150	45	40	64	80	80	100
Chewacla	I	140	40	34	64	80	80	100
Chickahominy	LL	65	20	15	24	30	30	38
Chilhowie	JJ	65	20	15	40	50	50	63
Chincoteague	PP	65	20	15	24	30	30	38
Chipley	EE	85	25	18	48	60	60	75
Christian	AA	100	35	25	56	70	70	88
Christiana	AA	100	35	25	56	70	70	88
Clarksburg	W	100	35	25	40	50	50	63
Clarksville	GG	85	25	18	40	50	50	63
Clearbrook	JJ	65	20	15	40	50	50	63
Clifton	L	130	40	32	64	80	80	100
Clymer	U	110	40	30	56	70	70	88
Codorus	A	160	50	40	64	80	80	100
Codorus variant	A	160	50	40	64	80	80	100
Colfax	BB	85	25	18	48	60	60	75
Colfax variant	BB	85	25	18	48	60	60	75
Comus	A	160	50	40	64	80	80	100

Conetoe	DD	85	25	18	56	70	70	88
Congaree	A	160	50	40	64	80	80	100
Corolla	EE	85	25	18	48	60	60	75
Corydon	JJ	65	20	15	40	50	50	63
Cotaco	G	140	40	34	64	80	80	100
Cotaco variant	G	140	40	34	64	80	80	100
Coxville	LL	65	20	15	24	30	30	38
Craigsville	CC	85	25	18	56	70	70	88
Craven	HH	85	25	18	48	60	60	75
Creedmoor	KK	65	20	15	32	40	40	50
Creedmoor variant	KK	65	20	15	32	40	40	50
Croton	LL	65	20	15	24	30	30	38
Cullen	N	130	40	32	64	80	80	100
Culpeper	X	100	35	25	56	70	70	88
Daleville (drained)	C	150	45	40	56	70	70	88
Daleville (undrained)	OO	65	20	15	24	30	30	38
Dandridge	JJ	65	20	15	40	50	50	63
Davidson	N	130	40	32	64	80	80	100
Dawhoo	PP	65	20	15	24	30	30	38
Dawhoo variant	PP	65	20	15	24	30	30	38
Decatur	M	130	40	32	64	80	80	100
Dekalb	FF	85	25	18	48	60	60	75
Delanco	B	160	50	40	64	90	90	113
Deloss (drained)	C	150	45	40	56	70	70	88
Deloss (undrained)	OO	65	20	15	24	30	30	38
Dogue	K	130	40	32	64	80	80	100
Dorovan	PP	65	20	15	24	30	30	38
Dothan	Q	120	40	30	56	70	70	88
Dragston	E	140	40	34	64	80	80	100
Drall	FF	85	25	18	48	60	60	75
Duckston	QQ	65	20	15	24	30	30	38
Duffield	G	140	40	34	64	80	80	100
Dulles	Y	100	35	25	48	60	60	75
Dumfries	T	110	40	30	56	70	70	88
Dunbar (drained)	P	130	40	32	56	70	70	88
Dunbar (undrained)	Z	100	35	25	40	50	50	63
Dunning (drained)	H	65	20	15	24	30	30	38

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Dunning (undrained)	NN	65	20	15	24	30	30	38
Duplin	K	130	40	32	64	80	80	100
Durham	CC	85	25	18	56	70	70	88
Dyke	O	130	40	32	64	80	80	100
Edgehill	CC	85	25	18	56	70	70	88
Edgehill variant	CC	85	25	18	56	70	70	88
Edneytown	L	130	40	32	64	80	80	100
Edneyville	T	110	40	30	56	70	70	88
Edom	M	130	40	32	64	80	80	100

Elbert	LL	65	20	15	24	30	30	38
Elbert variant	LL	65	20	15	24	30	30	38
Elioak	X	100	35	25	56	70	70	88
Elk	A	160	50	40	64	80	80	100
Elkton (drained)	C	150	45	40	56	70	70	88
Elkton (undrained)	OO	65	20	15	24	30	30	38
Elliber	M	130	40	32	64	80	80	100
Elsinboro	L	130	40	32	64	80	80	100
Emory	G	140	40	34	64	80	80	100
Emporia	R	120	40	30	56	70	70	88
Endcav	Y	100	35	25	48	60	60	75
Enon	Y	100	35	25	48	60	60	75
Ernest	W	100	35	25	40	50	50	63
Eubanks	N	130	40	32	64	80	80	100
Eunola	T	110	40	30	56	70	70	88
Evansham	LL	65	20	15	24	30	30	38
Evard	L	130	40	32	64	80	80	100
Evesboro	II	65	20	15	48	60	60	75
Faceville	R	120	40	30	56	70	70	88
Fairfax	D	150	45	40	64	80	80	100
Fallsington	E	140	40	34	64	80	80	100
Fauquier	N	130	40	32	64	80	80	100
Faywood	U	110	40	30	56	70	70	88
Featherstone	PP	65	20	15	24	30	30	38
Fisherman	QQ	65	20	15	24	30	30	38
Fletcher	U	110	40	30	56	70	70	88
Fluvanna	Y	100	35	25	48	60	60	75
Forestdale	LL	65	20	15	24	30	30	38
Fork (drained)	P	130	40	32	56	70	70	88
Fork (undrained)	Z	100	35	25	40	50	50	63
Fork variant (drained)	P	130	40	32	56	70	70	88
Fork variant (undrained)	Z	100	35	25	40	50	50	63
Frankstown	U	110	40	30	56	70	70	88
Frederick	M	130	40	32	64	80	80	100
Frederick/Lodi	M	130	40	32	64	80	80	100
Freemanville	Q	120	40	30	56	70	70	88
French	A	160	50	40	64	80	80	100
Fripp	QQ	65	20	15	24	30	30	38
Gaila	FF	85	25	18	48	60	60	75
Gainesboro	FF	85	25	18	48	60	60	75
Galestown	II	65	20	15	48	60	60	75
Georgeville	X	100	35	25	56	70	70	88
Gilpin	U	110	40	30	56	70	70	88
Gilpin variant	U	110	40	30	56	70	70	88
Glenelg(BRH)	N	130	40	32	64	80	80	100
Glenelg(NV)	U	110	40	30	56	70	70	88
Glenville	W	100	35	25	40	50	50	63
Goldsboro	J	130	40	32	64	80	80	100
Goldston	JJ	65	20	15	40	50	50	63

SOIL FULL DOUBLE

SOIL SERIES	MANAGEMENT GROUP	CORN	SEASON SOYBEAN	CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Goldvein	BB	85	25	18	48	60	60	75
Granville	R	120	40	30	56	70	70	88
Greendale	A	160	50	40	64	80	80	100
Grigsby	A	160	50	40	64	80	80	100
Grimsley	GG	85	25	18	40	50	50	63
Gritney	T	110	40	30	56	70	70	88
Groseclose	M	130	40	32	64	80	80	100
Grover	X	100	35	25	56	70	70	88
Guernsey	M	130	40	32	64	80	80	100
Gundy	V	100	35	25	56	70	70	88
Gunstock	V	100	35	25	56	70	70	88
Gwinnett variant	X	100	35	25	56	70	70	88
Hagerstown	M	130	40	32	64	80	80	100
Halewood	U	110	40	30	56	70	70	88
Hanceville	V	100	35	25	56	70	70	88
Hartleton	FF	85	25	18	48	60	60	75
Hartsells	CC	85	25	18	56	70	70	88
Hatboro	HH	85	25	18	48	60	60	75
Hawksbill	CC	85	25	18	56	70	70	88
Hayesville	X	100	35	25	56	70	70	88
Haymarket	KK	65	20	15	24	30	30	38
Hayter	L	130	40	32	64	80	80	100
Hazel	JJ	65	20	15	40	50	50	63
Hazleton	JJ	65	20	15	40	50	50	63
Helena	KK	65	20	15	24	30	30	38
Herndon	V	100	35	25	56	70	70	88
Hiwassee	O	130	40	32	64	80	80	100
Hiwassee variant	O	130	40	32	64	80	80	100
Hoadley	BB	85	25	18	48	60	60	75
Hollywood	LL	65	20	15	24	30	30	38
Hublersburg	M	130	40	32	64	80	80	100
Huntington	A	160	50	40	64	80	80	100
Hyde (drained)	C	150	45	40	56	70	70	88
Hyde (undrained)	OO	65	20	15	24	30	30	38
Iredell	KK	65	20	15	24	30	30	38
Iredell variant	KK	65	20	15	24	30	30	38
Iuka	F	140	40	34	64	80	80	100
Izagora	J	130	40	32	64	80	80	100
Jackland	KK	65	20	15	24	30	30	38
Jefferson	U	110	40	30	56	70	70	88
Jefferson variant	U	110	40	30	56	70	70	88
Johns (drained)	C	150	45	40	56	70	70	88
Johns (undrained)	OO	65	20	15	24	30	30	38
Johnston	PP	65	20	15	24	30	30	38
Johns variant (drained)	C	150	45	40	56	70	70	88
Johns variant (undrained)	OO	65	20	15	24	30	30	38
Kalmia	S	120	40	30	56	70	70	88

Kelly	KK	65	20	15	24	30	30	38
Kempsville	S	120	40	30	56	70	70	88
Kenansville	DD	85	25	18	56	70	70	88
Kenansville variant	DD	85	25	18	56	70	70	88
Keyport	K	130	40	32	64	80	80	100
Kinkora (drained)	C	150	45	40	56	70	70	88
Kinkora (undrained)	OO	65	20	15	24	30	30	38
Kinston (drained)	C	150	45	40	56	70	70	88
Kinston (undrained)	OO	65	20	15	24	30	30	38
Klej	EE	85	25	18	48	60	60	75
Klinesville	JJ	65	20	15	40	50	50	63

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Laidig	W	100	35	25	40	50	50	63
Lakehurst	EE	85	25	18	48	60	60	75
Lakeland	II	65	20	15	48	60	60	75
Lakin	II	65	20	15	48	60	60	75
Landisburg	W	100	35	25	40	50	50	63
Lanexa	PP	65	20	15	24	30	30	38
Lansdale	FF	85	25	18	48	60	60	75
Laroque	FF	85	25	18	48	60	60	75
Leadvale	BB	85	25	18	48	60	60	75
Leaf (drained)	C	150	45	40	56	70	70	88
Leaf (undrained)	OO	65	20	15	24	30	30	38
Leaksville	KK	65	20	15	24	30	30	38
Leck Kill	U	110	40	30	56	70	70	88
Leetonia	II	65	20	15	48	60	60	75
Legore	V	100	35	25	56	70	70	88
Lehew	JJ	65	20	15	40	50	50	63
Lenoir	LL	65	20	15	24	30	30	38
Leon	II	65	20	15	48	60	60	75
Levy	PP	65	20	15	24	30	30	38
Lew	FF	85	25	18	48	60	60	75
Lewisberry	II	65	20	15	48	60	60	75
Lewisburg	CC	85	25	18	56	70	70	88
Library	KK	65	20	15	24	30	30	38
Lickdale (drained)	H	65	20	15	24	30	30	38
Lickdale (undrained)	NN	65	20	15	24	30	30	38
Lignum	LL	65	20	15	24	30	30	38
Lily	FF	85	25	18	48	60	60	75
Linden	F	140	40	34	64	80	80	100
Lindside	A	160	50	40	64	80	80	100
Litz	JJ	65	20	15	40	50	50	63
Lloyd	N	130	40	32	64	80	80	100
Lloyd variant	N	130	40	32	64	80	80	100
Lobdell	A	160	50	40	64	80	80	100
Lodi	M	130	40	32	64	80	80	100
Louisa	JJ	65	20	15	40	50	50	63

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Louisa variant	JJ	65	20	15	40	50	50	63
Louisburg	FF	85	25	18	48	60	60	75
Lowell	M	130	40	32	64	80	80	100
Lucy	DD	85	25	18	56	70	70	88
Lumbee (drained)	C	150	45	40	56	70	70	88
Lumbee (undrained)	OO	65	20	15	24	30	30	38
Lumbee variant (drained)	C	150	45	40	56	70	70	88
Lumbee variant (undrained)	OO	65	20	15	24	30	30	38
Lunt	AA	100	35	25	56	70	70	88
Lynchburg	E	140	40	34	64	80	80	100
Madison	X	100	35	25	56	70	70	88
Magotha	PP	65	20	15	24	30	30	38
Malbis	W	100	35	25	40	50	50	63
Manassas	D	150	45	40	64	80	80	100
Manor	FF	85	25	18	48	60	60	75
Mantachie	I	140	40	34	64	80	80	100
Manteo	JJ	65	20	15	40	50	50	63
Marbie	W	100	35	25	40	50	50	63
Margo	A	160	50	40	64	80	80	100
Marlboro	R	120	40	30	56	70	70	88
Marr	T	110	40	30	56	70	70	88
Marumsco	K	130	40	32	64	80	80	100
Masada	L	130	40	32	64	80	80	100
Massanetta	A	160	50	40	64	80	80	100
Matapeake	R	120	40	30	56	70	70	88
Matneflat	CC	85	25	18	56	70	70	88
Mattamuskeet	PP	65	20	15	24	30	30	38
Mattan	PP	65	20	15	24	30	30	38
Mattapex	K	130	40	32	64	80	80	100
Mattaponi	R	120	40	30	56	70	70	88
Maury	M	130	40	32	64	80	80	100
Mayodan	V	100	35	25	56	70	70	88
McGary (drained)	P	130	40	32	56	70	70	88
McGary (undrained)	Z	100	35	25	40	50	50	63
McLaurin	DD	85	25	18	56	70	70	88
McQueen	B	160	50	40	64	90	90	113
Meadowville	G	140	40	34	64	80	80	100
Meadowville variant	G	140	40	34	64	80	80	100
Meckesville	W	100	35	25	40	50	50	63
Mecklenburg	V	100	35	25	56	70	70	88
Mecklenburg variant	V	100	35	25	56	70	70	88
Meggett (drained)	C	150	45	40	56	70	70	88
Meggett (undrained)	OO	65	20	15	24	30	30	38
Melvin (drained)	H	140	40	34	48	60	60	75
Melvin (undrained)	NN	65	20	15	24	30	30	38
Millrock	II	65	20	15	48	60	60	75

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Minnieville	N	130	40	32	64	80	80	100
Misenheimer	JJ	65	20	15	40	50	50	63
Molena	II	65	20	15	48	60	60	75
Monacan	I	140	40	34	64	80	80	100
Monongahela	W	100	35	25	40	50	50	63
Montalto	N	130	40	32	64	80	80	100
Montross	Q	120	40	30	56	70	70	88
Mount Lucas	J	130	40	32	64	80	80	100
Muckalee	MM	65	20	15	24	30	30	38
Munden	F	140	40	34	64	80	80	100
Murrill	G	140	40	34	64	80	80	100
Myatt (drained)	C	150	45	40	56	70	70	88
Myatt (undrained)	OO	65	20	15	24	30	30	38
Myatt variant (drained)	C	150	45	40	56	70	70	88
Myatt variant (undrained)	OO	65	20	15	24	30	30	387
Myersville	D	150	45	40	64	80	80	100
Nansemond	F	140	40	34	64	80	80	100
Nason	V	100	35	25	56	70	70	88
Nawney	PP	65	20	15	24	30	30	38
Neabsco	BB	85	25	18	48	60	60	75
Needmore	FF	85	25	18	48	60	60	75
Nestoria	JJ	65	20	15	40	50	50	63
Nevarc	HH	85	25	18	48	60	60	75
Newark (drained)	H	140	40	34	48	60	60	75
Newark (undrained)	NN	65	20	15	24	30	30	38
Newark variant (drained)	H	140	40	34	48	60	60	75
Newark variant (undrained)	NN	65	20	15	24	30	30	38
Newbern	JJ	65	20	15	40	50	50	63
Newflat	LL	65	20	15	24	30	30	38
Newhan	QQ	65	20	15	24	30	30	38
Nicholson	BB	85	25	18	48	60	60	75
Nimmo	E	140	40	34	64	80	80	100
Nixa	BB	85	25	18	48	60	60	75
Nolichucky	O	130	40	32	64	80	80	100
Nolin	A	160	50	40	64	80	80	100
Norfolk	R	120	40	30	56	70	70	88
Oakhill	FF	85	25	18	48	60	60	75
Oaklet	Y	100	35	25	48	60	60	75
Oatlands	FF	85	25	18	48	60	60	75
Occoquan	DD	85	25	18	56	70	70	88
Ochlockonee	II	65	20	15	48	60	60	75
Ochlockonee variant	II	65	20	15	48	60	60	75
Okeetee	LL	65	20	15	24	30	30	38
Opequon	JJ	65	20	15	40	50	50	63
Orange	KK	65	20	15	24	30	30	38
Orangeburg	R	120	40	30	56	70	70	88

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Orange variant	KK	65	20	15	24	30	30	38
Orenda	KK	65	20	15	24	30	30	38
Orrville (drained)	C	150	45	40	56	70	70	88
Orrville (undrained)	OO	65	20	15	24	30	30	38
Orrville variant (drained)	C	150	45	40	56	70	70	88
Orrville variant (undrained)	OO	65	20	15	24	30	30	38
Osier	E	140	40	34	64	80	80	100
Othello (drained)	C	150	45	40	56	70	70	88
Othello (undrained)	OO	65	20	15	24	30	30	38
Pacolet	X	100	35	25	56	70	70	88
Pactolus	EE	85	25	18	48	60	60	75
Pagebrook	Y	100	35	25	48	60	60	75
Pamlico	PP	65	20	15	24	30	30	38
Pamunkey	B	160	50	40	64	90	90	113
Pamunkey variant	B	160	50	40	64	90	90	113
Panorama	U	110	40	30	56	70	70	88
Pantego (drained)	C	150	45	40	56	70	70	88
Pantego (undrained)	OO	65	20	15	24	30	30	38
Parker	GG	85	25	18	40	50	50	63
Partlow	HH	85	25	18	48	60	60	75
Pasquotank (drained)	C	150	45	40	56	70	70	88
Pasquotank (undrained)	OO	65	20	15	24	30	30	38
Peawick	HH	85	25	18	48	60	60	75
Penn	FF	85	25	18	48	60	60	75
Philo (drained)	H	140	40	34	48	60	60	75
Philo (undrained)	NN	65	20	15	24	30	30	38
Pinkston	JJ	65	20	15	40	50	50	63
Pisgah	M	130	40	32	64	80	80	100
Plummer	EE	85	25	18	48	60	60	75
Pocalla	DD	85	25	18	56	70	70	88
Pocaty	PP	65	20	15	24	30	30	38
Pocomoke	E	140	40	34	64	80	80	100
Poindexter	FF	85	25	18	48	60	60	75
Poindexter variant	FF	85	25	18	48	60	60	75
Pooler variant (drained)	C	150	45	40	56	70	70	88
Pooler variant (undrained)	OO	65	20	15	24	30	30	38
Pope	A	160	50	40	64	80	80	100
Poplimento	M	130	40	32	64	80	80	100
Porters	FF	85	25	18	48	60	60	75
Portsmouth (drained)	C	150	45	40	56	70	70	88
Portsmouth (undrained)	OO	65	20	15	24	30	30	38
Pouncey	LL	65	20	15	24	30	30	38
Poynor	GG	85	25	18	40	50	50	63
Pungo	PP	65	20	15	24	30	30	38
Purcellville	D	150	45	40	64	80	80	100
Purdy (drained)	H	140	40	34	48	60	60	75
Purdy (undrained)	NN	65	20	15	24	30	30	38

Quantico	R	120	40	30	56	70	70	88
Rabun	N	130	40	32	64	80	80	100
Rains (drained)	C	150	45	40	56	70	70	88
Rains (undrained)	OO	65	20	15	30	30	38	
Ramsey	JJ	65	20	15	40	50	50	63
Rapidan	N	130	40	32	64	80	80	100
Rappahanock	PP	65	20	15	24	30	30	38
Raritan	W	100	35	25	40	50	50	63
Rayne	U	110	40	30	56	70	70	88
Readington	W	100	35	25	40	50	50	63
Reaville	JJ	65	20	15	40	50	50	63
Remlik	DD	85	25	18	56	70	70	88
Rigley	CC	85	25	18	56	70	70	88
Rion	X	100	35	25	56	70	70	88
Riverview	G	140	40	34	64	80	80	100
Roanoke (drained)	H	140	40	34	48	60	60	75
Roanoke (undrained)	NN	65	20	15	24	30	30	38
Robertsville	LL	65	20	15	24	30	30	38
Rohrersville	BB	85	25	18	48	60	60	75
Ross	A	160	50	40	64	80	80	100
Rowland	A	160	50	40	64	80	80	100
Rumford	DD	85	25	18	56	70	70	88
Rushtown	FF	85	25	18	48	60	60	75
Ruston	S	120	40	30	56	70	70	88
Saffell	DD	85	25	18	56	70	70	88
Sassafras	T	110	40	30	56	70	70	88
Savannah	W	100	35	25	40	50	50	63
Schaffenaker	II	65	20	15	48	60	60	75
Seabrook	EE	85	25	18	48	60	60	75
Seagate	EE	85	25	18	48	60	60	75
Sedgefield	KK	65	20	15	24	30	30	38
Sekil	FF	85	25	18	48	60	60	75
Seneca	G	140	40	34	64	80	80	100
Sequatchie	B	160	50	40	64	90	90	113
Sequoia	U	110	40	30	56	70	70	88
Shelocta	L	130	40	32	64	80	80	100
Shelocta variant	L	130	40	32	64	80	80	100
Shenval	O	130	40	32	64	80	80	100
Sherando	CC	85	25	18	56	70	70	88
Shouns	G	140	40	34	64	80	80	100
Slabtown	G	140	40	34	64	80	80	100
Slagle	K	130	40	32	64	80	80	100
Spivey	FF	85	25	18	48	60	60	75
Spotsylvania	V	100	35	25	56	70	70	88
Spray	JJ	65	20	15	40	50	50	63
Spriggs	JJ	65	20	15	40	50	50	63
Stanton	LL	65	20	15	24	30	30	38
Starr	G	140	40	34	64	80	80	100
Starr-Dyke	O	130	40	32	64	80	80	100

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Staser	A	160	50	40	64	80	80	100
State (ES)	T	110	40	30	56	70	70	88
State (Mainland)	B	160	50	40	64	90	90	113
Steinsburg	JJ	65	20	15	40	50	50	63
Stoneville	X	100	35	25	56	70	70	88
Stough	F	140	40	34	64	80	80	100
Stumptown	FF	85	25	18	48	60	60	75
Suches	A	160	50	40	64	80	80	100
Sudley	D	150	45	40	64	80	80	100
Suffolk	T	110	40	30	56	70	70	88
Summers	GG	85	25	18	40	50	50	63
Susquehanna	KK	65	20	15	24	30	30	38
Sweetapple	FF	85	25	18	48	60	60	75
Swimley	M	130	40	32	64	80	80	100
Sycoline	KK	65	20	15	24	30	30	38
Talladega	JJ	65	20	15	40	50	50	63
Tallapoosa	JJ	65	20	15	40	50	50	63
Tallapoosa variant	JJ	65	20	15	40	50	50	63
Tarboro	II	65	20	15	48	60	60	75
Tatum	X	100	35	25	56	70	70	88
Tetotum	K	130	40	32	64	80	80	100
Tetotum variant	K	130	40	32	64	80	80	100
Thurmont	L	130	40	32	64	80	80	100
Tifton	Q	120	40	30	56	70	70	88
Timberville	G	140	40	34	64	80	80	100
Timberville variant	G	140	40	34	64	80	80	100
Tioga	A	160	50	40	64	80	80	100
Toccoa	II	65	20	15	48	60	60	75
Toddstav	HH	85	25	18	48	60	60	75
Tomotley (drained)	C	150	45	40	56	70	70	88
Tomotley (undrained)	OO	65	20	15	24	30	30	38
Torhunta	E	140	40	34	64	80	80	100
Totier	U	110	40	30	56	70	70	88
Toxaway (drained)	C	150	45	40	56	70	70	88
Toxaway (undrained)	OO	65	20	15	24	30	30	38
Trappist	U	110	40	30	56	70	70	88
Trego	W	100	35	25	40	50	50	63
Trenholm	KK	65	20	15	24	30	30	38
Tuckahoe	A	160	50	40	64	80	80	100
Turbeville	O	130	40	32	64	80	80	100
Tusquitee	G	140	40	34	64	80	80	100
Tygart (drained)	P	130	40	32	56	70	70	88
Tygart (undrained)	Z	100	35	25	40	50	50	63
Uchee	DD	85	25	18	56	70	70	88
Unison	L	130	40	32	64	80	80	100
Unison variant	L	130	40	32	64	80	80	100

Vance	Y	100	35	25	48	60	60	75
Varina	Q	120	40	30	56	70	70	88
Vaucluse	Q	120	40	30	56	70	70	88
Vertrees	M	130	40	32	64	80	80	100
Wadesboro	X	100	35	25	56	70	70	88
Wagram	DD	85	25	18	56	70	70	88
Wahee (drained)	C	150	45	40	56	70	70	88
Wahee (undrained)	OO	65	20	15	24	30	30	38
Wakulla	II	65	20	15	48	60	60	75
Wallen	JJ	65	20	15	40	50	50	63
Watauga	V	100	35	25	56	70	70	88
Wateree	FF	85	25	18	48	60	60	75
Watt	JJ	65	20	15	40	50	50	63
Watt variant	JJ	65	20	15	40	50	50	63
Waxpool	LL	65	20	15	24	30	30	38
Waynesboro	L	130	40	32	64	80	80	100
Weaver	A	160	50	40	64	80	80	100
Webbtown	U	110	40	30	56	70	70	88
Wedowee	V	100	35	25	56	70	70	88
Weeksville (drained)	C	150	45	40	56	70	70	88
Weeksville (undrained)	OO	65	20	15	24	30	30	38

SOIL SERIES	SOIL MANAGEMENT GROUP	CORN	FULL SEASON SOYBEAN	DOUBLE CROP SOYBEAN	STANDARD WHEAT	INTENSIVE WHEAT	STANDARD BARLEY	INTENSIVE BARLEY
Wehadkee	MM	65	20	15	24	30	30	38
Weikert	JJ	65	20	15	40	50	50	63
Westmoreland	U	110	40	30	56	70	70	88
Weston	E	140	40	34	64	80	80	100
Westphalia	II	65	20	15	48	60	60	75
Weverton	GG	85	25	18	40	50	40	63
Wheeling	A	160	50	40	64	80	80	100
Whiteford	U	110	40	30	56	70	70	88
White Store	KK	65	20	15	24	30	30	38
White Store variant	KK	65	20	15	24	30	30	38
Wickham	B	160	50	40	64	90	90	113
Wickham variant	B	160	50	40	64	90	90	113
Wilkes	JJ	65	20	15	40	50	50	63
Woodington	EE	85	25	18	48	60	60	75
Woodstown	J	130	40	32	64	80	80	100
Worsham	HH	85	25	18	48	60	60	75
Worsham variant	HH	85	25	18	48	60	60	75
Wrightsboro	J	130	40	32	64	80	80	100
Wurno	JJ	65	20	15	40	50	50	63
Yadkin	X	100	35	25	56	70	70	88
Yemassee (drained)	C	150	45	40	56	70	70	88
Yemassee (undrained)	OO	65	20	15	24	30	30	38
Yeopim	K	130	40	32	64	80	80	100
York	BB	85	28	18	48	60	60	75
Zion	Y	100	35	25	48	60	60	75

Zion variant	Y	100	35	25	48	60	60	75
Zoar	K	130	40	32	64	80	80	100

APPENDIX B

Table B1. Corn for Grain

I. Nitrogen Recommendations:

1 lb. of N/Bu of expected yield. Refer to Table A4 for soil yield estimates.

II. Phosphorus and Potassium Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

III. Comments to Accompany Recommendations:

A. For soils testing high in P and/or K.

"The most effective method of application of low rates of phosphate and potash is in a starter (planter) fertilizer placed in a band 2 inches to one side and 2 inches below the seed. Because of potential salt toxicity, the total amount of nitrogen plus potash should not exceed 80 lbs/A."

B. For soils with leaching indices of 15 or greater.

"Potassium can be lost through leaching on these soils. You can apply up to 50 lb/acre of K_20 in a starter fertilizer and sidedress the remainder when the corn is about 18 inches tall."

C. For nitrogen - identify the soil management group.

1. For soil management groups

A, B, C, D, G, H, I, J, K, L, M, N, O, P, V, W, X, AA, BB and CC

and

The previous crop was alfalfa, alfalfa - grass red clover-grass, tall grass (orchard grass or fescue) and clover, grass-clover pasture (> 25% legume) or native pasture (> 25% legume)

and/or

Manure or sludge has been applied or there is a history of manure application.

"The soils, cropping sequence and management indicate significant amounts of nitrogen could be present in the soil at the time corn would be sidedressed. Apply 30 lb N per acre in a starter (planter) fertilizer. Test the soil for nitrate when the corn is about 12 inches tall to determine if sidedressing is needed."

2.For soil management groups W, BB

"Fragipans in these soils will limit depth of root penetration and increase the probability of nitrogen being moved beyond the reach of the plant root system. Apply 30 lb/acre of N in a starter fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

3. For soil management groups FF, GG, JJ

"These shallow soils limit the depth of root penetration which increases the likelihood of nitrogen being moved beyond the reach of the plant root system. To avoid this, apply 30 lb/acre of N in a starter (planter) fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

4. For soil management groups C, H, P

Nitrogen can be lost through denitrification and to surface waters through the drainage system. To reduce the likelihood of this happening, apply 30 lb N per acre in a starter (planter) fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

5.For soils with leaching indices of 15 or greater

"Because these are highly leachable soils, total nitrogen application should be split between an at-planting and a sidedressing application. Apply 30 lb N/acre in a starter (planter) fertilizer and the remainder when the corn is about 18 inches tall."

D.For soil management groups BB, CC, DD, EE, FF, GG, HH, II, JJ, KK, LL and MM

"Because these soils have such low yield potentials for corn, it is doubtful you can recover your variable cost of production. Consideration of an alternative crop or cropping sequence is recommended."

E.For soil management groups NN, OO, PP, QQ

"Attempted production of corn on these soils is not recommended."

Table B2. Corn for Silage

I. Nitrogen Recommendations:

The relationship between corn grain versus corn silage is described in the following table:

Silage Yield as Compared to Grain Yield[1]:

Corn yield[2] bushel/acre	Silage[3,4] tons/acre	Corn grain % of DM	Corn grain[2] bushel/ton
50- 60	9.0	40	5.90
61- 70	10.5	42	6.20
71- 80	11.5	44	6.50
81- 90	12.5	46	6.80
91-100	13.7	47	7.00
101-110	15.0	48	7.10
111-120	16.0	49	7.20
121-130	17.0	49	7.20
131-140	18.5	49	7.20

[1] Values in this table are based on 11 years of data from the Galva-Primghar Research Center. Data supplied by W.D. Shrader.
[2] Corn grain at 15.5 percent moisture.
[3] Silage at 35 percent dry matter.
[4] Silage yield obtained at midpoint of the corn yield per acre range in column 1.

(Source: Iowa St. Univ., Pm-417d, Oct 1978)

Equation to convert corn grain to corn silage yields:

Silage (T/A) = 3 + 0.114 x grain yield (Bu/A)

The optimum realistic yield for corn silage is somewhat higher than corn grown for grain because of the higher comparable value of corn silage. For example, 100 bushels of corn, at $2.50/bushel, is worth $250 whereas the equivalent silage yield, 14.4 tons, at $25.00/tons is worth $360. Calculations to determine the optimum realistic yield for corn silage using the data in Soil Management Group T, using $0.25/lb N and $25.00/ton silage are presented in the following table:

Calculation Used to Determine Optimistic Realistic Yield for Corn Silage (refer to text for calculations for corn grain).

Bu/Acre	Target Yield Tons/Acre	(Column 2) Total Cost of Excessive N Application, $/Acre	(Column 3) Total Income Forfeiture due to Insufficient N, $/Acre	Difference Between Col. 2 and Col. 3
116	16.2	81.00	110.00	29.00
117	16.3	83.50	102.50	15.00
118	16.5	86.50	95.00	8.50
119[H]	16.6	88.50	90.00	1.50
120	16.7	91.00	32.50	58.50

H Realistic Yield

The optimum realistic yield for corn grain for silage on Soil Management Group T soils is 16.6 T/A (119 bu/A equivalent) as compared to 111 bu/A when corn is grown for (sale of) grain. This relationship, approximately an 8% greater target yield, is similar for all the Soil Management Groups in this study (because of the fairly straightforward relationship between corn grain versus silage prices). Since the assumption has been made in this study that the amount of N needed to produce a given yield of corn is one pound per bushel, the nitrogen rate at which to fertilize corn silage should be increased approximately 8% above the N rate recommended for corn grown for grain.

As with corn grown for grain, large fluctuations in nitrogen and silage value dictate only small changes in the optimum yield of corn silage for which one should fertilize.

II. Phosphorus and Potassium Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	160-240
M	40- 80	80-160
H	20- 40	40- 80
VH	0	0

III. Comments to Accompany Recommendations:

A. For soils testing high in P and/or K.

"The most effective method of application of low rates of phosphate and potash is in a starter (planter) fertilizer placed in a band 2 inches to one side and 2 inches below the seed. Because of potential salt toxicity, the total amount of nitrogen plus potash should not exceed 80 lbs/A."

B. For soils with leaching indices of 10 or greater.

"Potassium can be lost through leaching on these soils. You can apply up to 50 lb/acre of K_20 in a starter fertilizer and sidedress the remainder when the corn is about 18 inches tall."

C. For nitrogen - identify the soil management group.

1. For soil management groups

A, B, C, D, G, H, I, J, K, L, M, N, O, P, V, W, X, AA, BB and CC

and

The previous crop was alfalfa, alfalfa - grass red clover-grass, tall grass (orchard grass or fescue) and clover, grass-clover pasture (> 25% legume) or native pasture (> 25% legume)

and/or

Manure or sludge has been applied or there is a <u>history</u> of manure application.

"The soils, cropping sequence and management indicate significant amounts of nitrogen could be present in the soil at the time corn would be sidedressed. Apply 30 lb N per acre in a starter (planter) fertilizer. Test the soil for nitrate when the corn is about 12 inches tall to determine if sidedressing is needed."

2.For soil management groups W, BB

"Fragipans in these soils will limit depth of root penetration and increase the probability of nitrogen being moved beyond the reach of the plant root system. Apply 30 lb/acre of N in a starter fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

3. For soil management groups FF, GG, JJ

"These shallow soils limit the depth of root penetration which increases the likelihood of nitrogen being moved beyond the reach of the plant root system. To avoid this, apply 30 lb/acre of N in a starter (planter) fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

4. For soil management groups C, H, P

Nitrogen can be lost through denitrification and to surface waters through the drainage system. To reduce the likelihood of this happening, apply 30 lb N per acre in a starter (planter) fertilizer and sidedress the remainder of the total application when the corn is about 18 inches tall."

5.For soils with leaching indices of 15 or greater

"Because these are highly leachable soils, total nitrogen application should be split between an at-planting and a sidedressing application. Apply 30 lb N/acre in a starter (planter) fertilizer and the remainder when the corn is about 18 inches tall."

D.For soil management groups BB, CC, DD, EE, FF, GG, HH, II, JJ, KK, LL and MM

"Because these soils have such low yield potentials for corn, it is doubtful you can recover your variable cost of production. Consideration of an alternative crop or cropping sequence is recommended."

E.For soil management groups NN, OO, PP, QQ

"Attempted production of corn on these soils is not recommended."

Table B3. Grain Sorghum

I. Nitrogen Recommendations:

1 lb. of N/Bu of expected yield. Refer to Table A4 for soil yield estimates.

II. Phosphorus and Potassium Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A)	
	P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

III. Comments to Accompany Recommendations:

A. For soils testing high in P and/or K.

"The most effective method of application of low rates of phosphate and potash is in a starter (planter) fertilizer placed in a band 2 inches to one side and 2 inches below the seed. Because of potential salt toxicity, the total amount of nitrogen plus potash should not exceed 80 lbs/A."

B. For soils with leaching indices of 10 or greater.

"Potassium can be lost through leaching on these soils. You can apply up to 50 lb/acre of K_20 in a starter fertilizer and sidedress the remainder when the grain sorghum is about 18 inches tall."

C. For nitrogen - identify the soil management group.

1. For soil management groups

A, B, C, D, G, H, I, J, K, L, M, N, O, P, V, W, X, AA, BB and CC

and

The previous crop was alfalfa, alfalfa - grass red clover-grass, tall grass (orchard grass or fescue) and clover, grass-clover pasture (> 25% legume) or native pasture (> 25% legume)

and/or

Manure or sludge has been applied or there is a history of manure application.

"The soils, cropping sequence and management indicate significant amounts of nitrogen could be present in the soil at the time grain sorghum would be sidedressed. Apply 30 lb N per acre in a starter (planter) fertilizer. Test the soil for nitrate when the grain sorghum is about 12 inches tall to determine if sidedressing is needed."

2.For soil management groups W, BB

"Fragipans in these soils will limit depth of root penetration and increase the probability of nitrogen being moved beyond the reach of the plant root system. Apply 30 lb/acre of N in a starter fertilizer and sidedress the remainder of the total application when the grain sorghum is about 18 inches tall."

3. For soil management groups FF, GG, JJ

"These shallow soils limit the depth of root penetration which increases the likelihood of nitrogen being moved beyond the reach of the plant root system. To avoid this, apply 30 lb/acre of N in a starter (planter) fertilizer and sidedress the remainder of the total application when the grain sorghum is about 18 inches tall."

4. For soil management groups C, H, P

Nitrogen can be lost through denitrification and to surface waters through the drainage system. To reduce the likelihood of this happening, apply 30 lb N per acre in a starter (planter) fertilizer and sidedress the remainder of the total application when the grain sorghum is about 18 inches tall."

5.For soils with leaching indices of 15 or greater

"Because these are highly leachable soils, total nitrogen application should be split between an at-planting and a sidedressing application. Apply 30 lb N/acre in a starter (planter) fertilizer and the remainder when the grain sorghum is about 18 inches tall."

D.For soil management groups BB, CC, DD, EE, FF, GG, HH, II, JJ, KK, LL and MM

"Although grain sorghum has more drought tolerance than corn, it is questionable whether you can recover your variable cost of production because of the low yield potential for this soil. Consideration of an alternative crop or cropping sequence should be evaluated."

E.For soil management groups NN, OO, PP, QQ

"Attempted production of grain sorghum on these soils is not recommended."

Table B4. Soybeans

I. Nitrogen Recommendations:

None recommended.

II. Phosphorous and Potassium Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

Table B5. Wheat and Barley

A. Recommendations for N application:

1. At planting.

   a. With NO_3^- soil test from top 6 inches

   If a NO_3^- soil test from the top 6 inches is greater than 14 ppm,

   No nitrogen needed at planting.

   b. Without NO_3^- soil test results.

   (1)Conventional tillage: broadcast and incorporate 1-2 inches, 25-30 lb N/acre during land preparation for planting. However, if a NO_3^- soil test from the top 6 inches is greater than 14 ppm, then no nitrogen is needed at planting.

   (2)No-till: broadcast 25-30 lb N/acre shortly before planting. However, if a NO_3^- soil test from the top 6 inches is greater than 14 ppm, then no nitrogen is needed at planting.

2. Midwinter (December-January)

   If:

   a.Significant leaching rains have occurred during the October-December period, i.e., two or more rainfall events of 2.0 inches or more,

   and

   b.there has been very little tiller development, i.e., less than 3 tillers per plant, and the crop has a pale green color,

   and

   c.there is an expectation of several days during January and February when maximum daily temperature will exceed 50EF;

   Then:

   Apply 30 lb N/acre as a topdressing.

3. Late Winter (February-early March)

   a. Single application of N.

   (1) Fields with less than 100 tillers per sq. ft. Apply 80 lb N/acre in February. Fertilize those fields with less than 60 tillers per sq. ft. first.

   (2) Fields with more than 100 tillers per sq. ft., plants dark green and N tissue levels are 3.75% or higher. Apply 30-40 lb N/acre in late March (Zadoks growth stage 30).

b. Split applications of N

(1) February (Zadoks growth stage 25).

(a) Fields with less than 60 tillers per sq. ft. Apply 60 lb N/acre.

(b) Fields with 60 to 100 tillers per sq. ft. Apply 40 lb N/acre.

(c) Fields with more than 100 tillers per sq. ft. and the crop has a good green color - do not apply nitrogen. Tissue test at Zadoks growth stage 30 to determine N application needs.

(2) March (Zadoks growth stage 30).

(a) N application rate for wheat based on the % N in a plant tissue sample taken at Zadoks growth stage 30. (Observations have shown that barley should be decreased by 0.5% N):

B. Phosphorus and Potassium Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

C. Comments to accompany recommendations:

1. For soil management groups KK, LL, MM, NN, OO, PP and QQ. These soils are not suited for production of small grains. It is recommended you consider another crop.

2. For soil management groups C, H, P, and Z. There will likely be periods of time during the winter and early spring when these soils will be very wet, making field operations very difficult if not impossible. This excess water could also damage small grain plant-resulting in lower yields.

3. For soils with leaching indices greater than 15. These soils are highly leachable because of thick sandy surfaces. The late winter-early spring nitrogen application should be divided between one made at Zadoks growth stage 25 (February) and one made at Zadoks growth stage 30 (March).

Table B6. Rye Grown for Grain or Silage

1. Soil productivity groups same as for wheat and barley

2. Nitrogen recommendations:

   A. at planting - 25-30 lb. N/acre

   B. late winter - a single application made in February

      (1). For grain production - 45 lb. N/acre

      (2). For silage production - 70 lb. N/acre

3. P and K Recommendations:

Soil Test	Fertilizer Recommendations (lb/A)	
Level	P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

Table B7. Cotton

I. Nitrogen Recommendations:

The planned rate of total nitrogen application should take into consideration the crop that cotton will be following and the soil on which it will be grown. The following suggestions consider both:

Soil Management Groups on Which Cotton Will Be Grown	Total N Application Lb/Acre
I. A, AA, B, C, E, J, K	50-60
II. F, Q, R, S, T, DD, II	60-90
III. N, O, V, X	50-70

Reduce the planned rate of nitrogen application by 10 pounds per acre if cotton will be following soybeans and by 20 pounds per acre if it will follow peanuts.

IV. Soil Management Groups that are not suited for cotton production: P, Z, BB, CC, EE, FF, HH, JJ, KK, LL, MM, NN, OO, PP, QQ.*

V. Soil Management Groups on which cotton will not be grown: D, G, H, I, J, L, M, U, W, Y, GG.

* Print out a statement such as, "Soils in this field are not suited for cotton production. If at all possible, select another field, but if cotton will be grown, apply 50-70 lbs of N per acre."

Timing of Nitrogen Application

Only about 20 percent of the total nitrogen uptake will have occurred by early square formation (approximately 45 days after planting). To avoid possible stimulation of excessive vegetative growth and loss of unneeded nitrogen through leaching, apply only one third of the planned nitrogen application rate at planting. The most effective method of application of this nitrogen is in a starter fertilizer which would also supply 20 to 40 pounds of P_2O_5 depending upon P_2O_5 needs as shown by a soil test. This can be done by using either a 1:1:0 ratio fertilizer such as 15-15-0, a 1:2:0 ratio fertilizer such as 18-46-0 or a 1:3:0 fertilizer such as 10-34-0. Use of a starter fertilizer has been shown to stimulate the early growth rate and increase lint cotton yields by 60 to 100 pounds per acre, both of which are desirable.

The preferred placement of this starter fertilizer is two inches to one side of the seed and at least as deep as the seeds are planted but preferably one to two inches below seed level. Placing the starter fertilizer in the row behind the subsoiler shank while ripping under the row has also been shown to be an effective placement. However, applying the starter fertilizer in a 3 to 4 inch wide band on the soil surface in front of the press wheel has not proven to be an effective placement method in research conducted in North Carolina.

The remainder of the planned nitrogen application can be applied at first square formation (approximately 45 days after planting).

The growth of cotton should be checked at early bloom to determine whether or not additional nitrogen may be needed. If the plants are no more than 20 inches tall yet adequate water has been provided either through rainfall or irrigation and neither insect, disease or weed infestations have limited growth, an additional nitrogen application of approximately 30 pounds per acre should be considered. If the plants at early bloom are 24 inches or more in height, do not apply any more nitrogen. When making this evaluation, the most recent growth is the best indicator of nitrogen needs, For example, if the plants were 21 to 22 inches tall but the top internodes were only or 1 1/4 - 1 1/3 inches in length, a small N application would be appropriate. However, if plants had the same height but the top internodes were two inches or more in length, indications are that vegetative growth is beginning. An additional nitrogen application would very likely stimulate excessive vegetative growth.

One should keep in mind that factors other than insufficient nitrogen can cause short plant heights. Some of these are water stress, root pruning caused by cultivation and the use of certain herbicides. These effects should be checked when making the decision about application of additional nitrogen.

Replacement of Nitrogen Lost through Leaching

Nitrogen can be lost through leaching when rainfall in excess of the water holding capacity of the soil occurs within a period of 5 days or less. This is the most likely to occur on those soils with low water holding capacities and are included in Soil Management Groups F, Q, S, T, DD and II.

Adjustment for suspected leaching losses are given in the following table:

Adjustment for Suspected Leaching Loss of Nitrogen

Inches of Excess Water[1]	Fraction of Total Applied Nitrogen That Needs Replacement[2]
1	1/5
2	1/3
3 or more	1/2 to 3/4

[1] Inches of water entering the soil during a 5 day period that is in excess of the soils water holding capacity.

[2] Extra nitrogen needed only through the third week of fruiting. (Nitrogen sidedressings are usually not beneficial after the third week of blooming.)

II. P and K Recommendations:

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40

VH	0	0

Table B8. Canola

Fertilization

I. <u>Nitrogen Fertilization:</u>

1. Apply 30 - 40 lb N/A at planting time. Broadcast and disc-in before planting.

2. Apply 90 - 120 lb N/A in late February just before spring growth begins. For soils with leaching indices greater than 15, the late winter application should be split with the first 45 to 60 lb/A being applied in late February and the second 45 to 60 lb/A being applied 4 weeks later.

I. <u>Phosphorus and Potassium Recommendations:</u>

Soil Test Level	Fertilizer Recommendations (lb/A) P_2O_5	K_2O
L	80-120	80-120
M	40- 80	40- 80
H	20- 40	20- 40
VH	0	0

Table B9. Peanuts

I. Nitrogen Recommendations:

No nitrogen recommended

II. Phosphorus and Potassium Recommendations:

The phosphorus and potassium recommended for peanuts can be applied at the same time the crop preceding peanuts in the rotation is fertilized. If is not applied at that time, it should be plowed down before peanuts are planted.

Soil Test	Fertilizer Recommendations (lb/A)	
Level	P_2O_5	K_2O
L	100-200	80-120
M	55- 85	0
H	0- 40*	0
VH	0	0

* Apply 40 lbs/A at H-. No P_20_5 recommended at H and H+.

III. Comments to Accompany Recommendations:

For soils with leaching indices of 15 or greater and peanuts are grown in the rotation. "Potassium can be lost through leaching. To insure an adequate supply for the peanut crop, apply that needed for the peanuts just before land preparation and plow it down."

Table B10. Alfalfa and Alfalfa-Orchardgrass Establishment

Soil Test Level	Fertilizer Recommendations, Lb/A		
	N	P_2O_5	K_20
L-	0	170	170
L	0	160	160
L+	0	150	150
M-	0	140	140
M	0	130	130
M+	0	120	120
H-	0	110	110
H	0	80	80
H+	0	50	50
VH	0	0	0

Table B11. Red Clover-Orchardgrass, Orchardgrass/Fescue-Ladino Clover, Orchardgrass and Fescue Establishment

Soil Test Level	Fertilizer Recommendations, Lb/A		
	N	P_2O_5	K_20
L-	40	170	170
L	40	160	160
L+	40	150	150
M-	40	140	140
M	40	130	130
M+	40	120	120
H-	40	110	110
H	40	75	75
H+	40	40	40
VH	40	0	0

* Apply the nitrogen at the time the grass is seeded in late summer, early fall or early spring. Overseed the grass with clover the following February.

Table B12. Bermudagrass Establishment

Soil Test Level	Fertilizer Recommendations, Lb/A		
	N	P_2O_5	K_20
L-	70	120	120
L	70	110	110
L+	70	100	100
M-	70	90	90
M	70	80	80
M+	70	70	70
H-	70	60	60
H	70	50	50

H+	70	40	40
VH	70	0	0

Table B13. Sudangrass, Sudan-Sorghum Hybrids and Millet Plantings

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	70	120	120
L	70	110	110
L+	70	100	100
M-	70	90	90
M	70	80	80
M+	70	70	70
H-	70	60	60
H	70	50	50
H+	70	40	40
VH	70	0	0

Table B14. Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group I*

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	0	120	450
L	0	110	420
L+	0	100	390
M-	0	90	360
M	0	80	330
M+	0	70	300
H-	0	60	210
H	0	50	120
H+	0	40	40
VH	0	0	0

* For K_2O rates greater than 200 lb/A, split the application, applying 1/2 in the fall and 1/2 in the spring. (Alternate recommendation where field sampled in spring - apply 1/2 in early spring, and 1/2 after the first cutting).

Table B15. Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group II*

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	0	120	330
L	0	110	300
L+	0	100	280
M-	0	90	270

M	0	80	245
M+	0	70	220
H-	0	60	200
H	0	50	120
H+	0	40	60
VH	0	0	0

* For K_2O rates greater than 200 lb/A, split the application, applying 1/2 in the fall and 1/2 in the spring. (Alternate recommendation where field sampled in spring - apply 1/2 in early spring, and 1/2 after the first cutting).

Table B16. Alfalfa and Alfalfa-Grass Hay Maintenance, Soil Productivity Group III

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	0	90	240
L	0	80	220
L+	0	70	200
M-	0	60	185
M	0	50	170
M+	0	40	160
H-	0	40	145
H	0	40	90
H+	0	40	40
VH	0	0	0

Table B17. Red Clover-Grass Hay Maintenance, Soil Productivity Groups I, II

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	0	120	240
L	0	110	220
L+	0	100	200
M-	0	90	185
M	0	80	170
M+	0	70	160
H-	0	60	145
H	0	50	90
H+	0	40	40
VH	0	0	0

Table B18. Red Clover-Grass Hay Maintenance, Soil Productivity Groups III, IV

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	0	90	145
L	0	80	130
L+	0	70	120
M-	0	60	110
M	0	50	95
M+	0	40	85
H-	0	40	75
H	0	40	55
H+	0	40	40

VH	0	0	0

Table B19. Stockpiled Tall Fescue, Soil Productivity Groups I, II

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	50-90*	120	120
L	50-90*	110	110
L+	50-90*	100	100
M-	50-90*	90	90
M	50-90*	80	80
M+	50-90*	40	40
H-	50-90*	0	0
H	50-90*	0	0
H+	50-90*	0	0
VH	50-90*	0	0

* Apply the N in August. Where clover makes up more than 25% of the stand, use the 50 lb N rate. If clover is not present and you desire maximum production, apply the 90 lb N rate.

Table B20. Stockpiled Tall Fescue, Soil Productivity Groups III, IV

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	40-60*	60	80
L	40-60*	50	70
L+	40-60*	40	60
M-	40-60*	30	50
M	40-60*	30	40
M+	40-60*	30	30
H-	40-60*	0	0
H	40-60*	0	0
H+	40-60*	0	0
VH	40-60*	0	0

* Apply the N in August. Where clover makes up more than 25% of the stand, use the 50 lb N rate. If clover is not present and you desire maximum production, apply the 90 lb N rate.

Table B21. Orchardgrass/Fescue-Clover Pastures, Soil Productivity Groups I, II*

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	0**	120	120
L	0**	110	110
L+	0**	100	100
M-	0**	90	90
M	0**	80	80
M+	0**	40	40
H-	0**	0	0
H	0**	0	0
H+	0**	0	0
VH	0**	0	0

* If stand contains less than 25% clover, apply 40-60 lbs/A of N.

** If additional production is needed later on, apply 40 to 60 lbs/A of N. If you are planning to overseed a legume into the stand, do not apply N.

Table B22. Orchardgrass/Fescue-Clover Pastures, Soil Productivity Groups III, IV*

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	0**	60	80
L	0**	50	70
L+	0**	40	60
M-	0**	30	50
M	0**	30	40
M+	0**	30	30
H-	0**	0	0
H	0**	0	0
H+	0**	0	0
VH	0**	0	0

* If stand contains less than 25% clover, apply 40-60 lbs/A of N.

** If additional production is needed later on, apply 40 to 60 lbs/A of N. If you are planning to overseed a legume into the stand, omit the N recommendation.

Table B23. Native or Unimproved Pastures, Soil Productivity Groups I, II*

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5**	K_2O**
L-	0	200	200
L	0	175	175
L+	0	150	150
M-	0	125	125
M	0	100	100
M+	0	75	75
H-	0	0	0
H	0	0	0
H+	0	0	0
VH	0	0	0

* If stand contains less than 25% clover, apply 40-60 lbs/A of N.

** For phosphorus + potassium application once each three or four years.

Table B24. Native or Unimproved Pastures, Soil Productivity Groups III, IV*

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5**	K_2O**
L-	0	120	120
L	0	110	110
L+	0	100	100
M-	0	90	90
M	0	80	80
M+	0	40	40
H-	0	0	0
H	0	0	0
H+	0	0	0
VH	0	0	0

* If stand contains less than 25% clover, apply 40-60 lbs/A of N.

** For phosphorus + potassium application once each three or four years.

Table B25. Orchardgrass/Fescue (Tall Grass) Hay Production, Soil Productivity Groups I, II

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	80-100*	120	240
L	80-100*	110	220
L+	80-100*	100	200
M-	80-100*	90	185
M	80-100*	80	170
M+	80-100*	70	160
H-	80-100*	60	145
H	80-100*	50	90
H+	80-100*	40	40
VH	80-100*	0	0

* The N recommendation is for a March application. If additional hay production is needed, apply 80 lbs N/acre after each cutting. Do not apply more than 250 lbs/acre per year.

Table B26. Orchardgrass/Fescue (Tall Grass) Hay Production, Soil Productivity Groups III, IV

Soil Test Level	Fertilizer Recommendations, Lb/A N	P_2O_5	K_20
L-	60-80*	90	145
L	60-80*	80	130
L+	60-80*	70	120
M-	60-80*	60	110
M	60-80*	50	95
M+	60-80*	40	85
H-	60-80*	40	70
H	60-80*	40	55
H+	60-80*	40	40
VH	60-80*	0	0

* N recommendation is for a March application. For additional fall hay production apply 60-80 lbs N/acre in late August/early September. Do not apply more than 160 lbs N/acre/year.

Table B27. Bermudagrass Pastures, All Soil Productivity Groups

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	175-225*	120	120
L	175-225*	110	110
L+	175-225*	100	100
M-	175-225*	90	90
M	175-225*	80	80
M+	175-225*	40	40
H-	175-225*	0	0
H	175-225*	0	0
H+	175-225*	0	0
VH	175-225*	0	0

* The N recommendation represents the total amount of N to be applied during the season. Split the N into three applications - April, June and July.

Table B28. Bermudagrass Hay Production, All Soil Productivity Groups

Soil Test	Fertilizer Recommendations, Lb/A		
Level	N	P_2O_5	K_20
L-	240-300*	120	275
L	240-300*	110	255
L+	240-300*	100	235
M-	240-300*	90	225
M	240-300*	80	205
M+	240-300*	70	185
H-	240-300*	60	165
H	240-300*	50	100
H+	240-300*	40	40
VH	240-300*	0	0

* Total application of N should be divided equally between an early April application and applications made after the first and second harvests.