Tobacco-grade fertilizers are available without P and can be custom-blended to supply the N and K_2O recommended on the soil test report. Select a mixed fertilizer grade that will supply nitrogen at a rate of 40 lb/acre, all the recommended P_2O_5 and up to 120 lb/acre of K_2O at planting or within 10 days after setting. You can apply additional nitrogen and/or potash later as a sidedressing.

Phosphate (P_2O_5) and Potash (K_2O) for Burley Tobacco

Soils in the burley tobacco region have high levels of phosphorus and potassium. These nutrients build-up when they are applied on a continual basis at rates that exceed soil test recommendations.

In 35 to 40% of the areas where burley is grown, a P_2O_5 or K_2O rate of 40 to 50 lb/acre is sufficient. This low rate reduces fertilizer costs as well as the potential for salt injury.

P_2O_5 and K_2O recommendations are specific for the soil tested. Select a mixed fertilizer that best supplies the recommended rates of P_2O_5 and K_2O. If an appropriate mixed grade is unavailable, use single-grade materials. Ammonium nitrate (33.5% N), triple superphosphate (46% P_2O_5) and sulfate of potash (50% K_2O) are acceptable.

Tissue Testing to Ensure Quality & Yield

Tissue testing should be an integral part of tobacco production. During the growing season, it can help identify nutrient deficiencies. At the end of the season, it can be used successfully to determine ripeness and facilitate decisions on timing of flue-cured tobacco harvest.

Additional information can be obtained from an NCDA&CS regional agronomist or the local Cooperative Extension office.

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NOTE 1: Fertilization of Tobacco

Historically, tobacco has been a heavily fertilized crop. Fertilizer recommendations on the soil test report produce high-yielding, quality tobacco assuming other limitations are negligible. The plant's ability to use nutrients depends on adequate lime having been applied, the method and timing of fertilization, variety selection and nematode management practices. Low yields and poor quality are seldom related to soil fertility alone.

Lime

The rate of lime recommended on the soil test report

- raises soil pH and maintains it between 5.8 and 6.2;
- supplies the essential nutrients calcium and magnesium;
- neutralizes aluminum, which becomes toxic to plant roots when the soil pH is too low; and
- enhances uptake and use of phosphorus.

Magnesium (Mg) & Sulfur (S)

Magnesium deficiency is typically seen on light-colored, sandy soils, often in seasons of high rainfall. Due to this fact, this condition is also known as "sand drown." Symptoms are seen as yellowing between veins on the lower leaves (interveinal chlorosis) that may progress midway up the stalk. The yellowing often begins at the tip or along leaf margins, progressing to the leaf's base and center. Tissue may appear white in extreme cases.

If there is a $ symbol in the *Mg* column on the soil test report, then magnesium levels are

low. If lime is needed, apply dolomitic lime since it will supply 120 lb Mg per ton. If lime is not recommended, apply a readily available source of magnesium at a rate of 20 to 30 lb/acre. Sulfate of potash-magnesia (0-0-22, 11.5% Mg) alone or in a blend is a good source of magnesium.

Sulfur is recommended for tobacco when the index (S-I) is 25 or lower. Tobacco often exhibits sulfur deficiency (general yellow color of whole plant) before lay-by. The crop may grow out of it later if roots reach the subsoil where sulfur accumulates. Crops growing on deep sandy soils where clay is 16 inches or more below the surface are especially vulnerable to sulfur deficiency.

Complete fertilizers may or may not contain sulfur. Good sources include 0-0-22 (23% S), 0-0-50 (18% S), or 24-S nitrogen solutions (3% by weight). Typically, applying sulfur at a rate of about 20 lb/acre will correct deficiencies.

Manganese (Mn)

Manganese deficiency can occur on sandy coastal plain soils when the pH is 6.2 or higher. The visual symptoms mimic closely those of weather fleck but are usually more severe. Small white flecks or lesions develop on lower leaves, and with time, the flecks turn brown. As the deficiency progresses, the flecks often join together resulting in dead tissue falling out of the leaf structure. In contrast to weather fleck, Mn-deficient plants are also stunted and have a slightly yellow color.

If *$pH* appears in the manganese availability-index (*Mn-AI*) column of the *Recommendations* section on the soil test report, there is a potential for Mn deficiency. This designation indicates that overliming is the principal cause of the deficiency. The *$ Note*, which accompanies the report, provides options to correct this problem.

When *Mn-AI* is 25 or lower and *pH* is below 6.2, the rate *10 lb/acre* appears in the *Mn* column of the *Recommendations* section. Manganese deficiency seldom occurs on piedmont or mountain soils. In these areas, toxicity is a more likely problem and is generally prevented by maintaining the soil pH near 6.0.

Zinc (Zn) and Copper (Cu)

Zinc and copper deficiencies have not been confirmed for tobacco. However, if the zinc index (*Zn-I*) or copper index (*Cu-I*) is below 25, a *$* symbol appears in the *Zn* or *Cu* column of the *Recommendations* section. Refer to the *$ Note* for application rates and methods if you wish to increase the levels of these nutrients in the soil.

Nitrogen (N) for Flue-Cured Tobacco

NCDA&CS soil test reports recommend a rate of 50 to 80 lb/acre based on a wide variety of soil and climatic conditions. This range represents the total nitrogen requirement (preplant and sidedress) and has been satisfactory in on-farm tests.

Rates of nitrogen are adjustable for each field, depending on depth of subsoil:

- where depth to subsoil is less than 5 inches, apply 50 lb/acre; and
- for each additional inch beyond 5 inches, apply 10 lb/acre until a maximum of 80 lb/acre is reached.

A nitrogen rate that exceeds recommendations can delay maturity and/or cause curing problems. Never apply more than 40 lb/acre at planting. Sidedress the remainder at lay-by.

Because of potential nitrogen problems, planting tobacco behind legumes or after recent application of farm manures is not recommended. However, the following guidelines may be helpful in situations where this practice is necessary:

- reduce the nitrogen rate by 15 to 20 lb/acre (potentially less on sandy soils) following legume crops;
- consider soil type and yield to evaluate nitrogen reductions following corn crops;
- reduce the nitrogen rate by 30 lb/acre for each ton of poultry litter applied; or
- reduce the nitrogen rate by 10 to 15 lb/acre for each ton of cattle manure applied.

Growers should certainly evaluate nitrogen sources based on handling and cost per pound. Liquid nitrogen products such as 24-S or 30% UAN solutions are less expensive. University tests with these fertilizers have shown no adverse effects on yield or quality when they are applied correctly. These materials should be knifed in or covered to prevent volatilization potential. Accurate calibration is especially important since these products or mixes are highly concentrated.

Nitrogen (N) for Burley Tobacco

NCDA&CS soil test reports recommend a nitrogen rate of 150 to 200 lb/acre based on research and on-farm tests. Soil type determines the actual rate used. The lower rate is appropriate on heavy-textured soils, particularly on sites where yields have never exceeded 2500 lb/acre.

Never exceed the higher rate on light-textured soils. Too much nitrogen causes ripening problems and reduces quality. Because of potential nitrogen problems, reduce the nitrogen rate 15 to 20 lb/acre following legumes, 30 lb/acre for each ton of poultry manure applied and 10 to 15 lb/acre for each ton of cattle manure applied.

Phosphate (P_2O_5) and Potash (K_2O) for Flue-Cured Tobacco

A good way to reduce expenses and off-site movement of phosphorus fertilizer is to apply less. About 85% of tobacco soils tested have a high to very high phosphorus index (P-I >50). On-farm tests show no benefit in yield or quality from routine application of phosphorus fertilizer to such soils. Only 15 lb of P_2O_5 is removed from the soil for each 2,500 lb of leaf harvested.