

SOILS TYPES AND LAND PREPARATION FOR TOBACCO PRODUCTION

LAND SELECTION

Before selecting a land for tobacco production a soil pit should be dug and the soil profile examined with particular attention to the subsoil. The most suitable soils for flue-cured tobacco production are light in texture (sands to sandy loams), deep and permeable and have adequate surface drainage. The crop can be grown on heavy-textured soils (sandy clay loam and heavier) provided the limitation of the soil type is recognized, i.e. excess soil nitrogen and the appropriate measures taken to overcome this by late-ploughing.

Tobacco is sensitive to waterlogging. Poorly drained soils, such as vlei margins or poorly permeable sub-soils should be avoided. Depending on the circumstances, these soils easily waterlog and may contain excessive amounts of nitrogen or other harmful salts in the subsoil and often the vlei soils have become acid through leaching. An abrupt change in texture from topsoil to subsoil, even though well drained, may also indicate excessive amounts of nitrogen in the subsoil.

Soils derived from sedimentary rocks often have poor physical properties in the topsoil which may result in surface crusting or compaction, poor aeration, poor infiltration of water and increased erodibility. They consequently require special management for successful production.

TIMING OF PLOUGHING

Soil texture, which is a measure of the relative proportions of clay, silt and sand in a soil, is an important factor in determining whether a soil should be early-or late-ploughed. The inherent fertility, which is usually but not always related to texture must also be considered. As a general rule, more fertile and heavier-textured soils are best ploughed late as are soils that have an abrupt change in texture from topsoil to subsoil.

Early-ploughing, before the end of the rains when the soil is still moist, has many advantages over late-ploughing. These include lower costs, greater uniformity of land preparation, greater moisture conservation, early and uniform decomposition of organic matter and hence readily available nitrogen at the time of planting. A good tilth is more easily obtained and conditions are favourable for water planting. For these reasons early-ploughing is recommended whenever possible.

On more fertile and heavier-textured soils, early-ploughing promotes the release of too much nitrogen for the production of good quality tobacco. However, knowledge of local conditions may enable such soils to be ploughed early. In general, however, they are best ploughed late.

Late-ploughing, when the soil is dry, allows little decomposition of organic matter before the following season's rains. Less soil nitrogen is available at planting and more fertilizer nitrogen is required than when soils are ploughed early. Also these soils require much more water than the light-textured ones for successful early-planting.

As a rule of thumb, ploughing from January to March/April may be considered as early-ploughed and ploughing from July onwards as late - ploughed.

Ploughing from early March to July has not been recommended in the past because of the uncertainty of the rains and consequent difficulty in predicting both the release of soil nitrogen and fertilizer nitrogen requirements of the crop. On soils that are slightly too fertile for a true early-ploughing, it is suggested that the soils are disced early and ploughed later. This practice will decrease the costs, make ploughing easier and produce a good tilth, as well as decreasing the amount of available nitrogen.

METHODS OF PLOUGHING

Growers should consult Tobacco Research Board Technical Bulletin No. 5 on "Tillage Systems for Flue-cured Tobacco" which contains comprehensive descriptions of the main methods of ploughing and information that can be used for more intensive tobacco production systems and conservation tillage.

Deep ploughing and good land preparation are essential for maximum yield and quality tobacco. Ploughing should be as deep as can be achieved with the equipment available, and as a rule should never be less than 23 cm.

Sub-soiling or ripping has been of benefit where it is difficult to obtain an initial deep cut or where a hard-pan has developed. It often makes ploughing of hard, dry soils easier. Soils should be sub-soiled at their driest to obtain the greatest shattering.

Where conditions permit, i.e. on a rotated soil which is free of roots and trash, early-ploughing with a mould board is most efficient. This is particularly true of pastures. On late-ploughed or trashy land a disc plough is more effective and will completely incorporate fibrous material in the soil.

A method of land preparation that is becoming popular is "rip and rhome". It is usually done early in the year and a second discing is sometimes necessary to help keep the land clean as the grass is not incorporated properly. If un-decomposed material is detected before ridging, the land must be considered as late-ploughed. Sometimes the operations are followed by ploughing and if this is done before the end of March when the soils are moist, the grass will have decomposed before ridging and an early-plough results. The later the ploughing the less likelihood the grass will have decomposed and the soil must be considered as late-ploughed. At Kutsaga the "rip and rhome" and ploughing operations are completed before the end of March.