– PRODUCTION GUIDELINE –

Tobacco

agriculture,
forestry & fisheries

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CONTENT

GENERAL ASPECTS

Classification

Scientific name: *Nicotiana tabacum*

Common names: Tobacco (English), tabak (Afrikaans) Motsoko (Setswana)
Family: Solanaceae

Origin and distribution

Tobacco originates from South America and is used as a psychoactive drug, narcotic, pain killer and pesticide. As a result, it was used in the ancient past in a wide variety of rituals and ceremonies. There were four species which were recognised in 1753 by Linnaeus. However, through research over 70 different species are recognised, almost all originating from South America, with one endemic to Australia and another to Africa. There are several tobacco types which are grown, depending on their intended use. In the United States, it is grown in northern middle Tennessee, western Kentucky and in Virginia. Tennessee produces approximately 20 percent, with smaller amounts produced in Indiana, North Carolina, Missouri, Ohio, Virginia and West Virginia. Burley tobacco is produced in many other countries, with major production being produced in Brazil, Malawi and Argentina.

Criollo tobacco is primarily produced in the making of cigars. It was one of the original Cuban tobaccos that emerged around the time of Columbus.

Oriental tobacco is a sun-cured, highly aromatic, small-leafed tobacco that is grown in Turkey, Greece, Bulgaria, Lebanon, and the Republic of Macedonia. It is frequently referred to as “Turkish tobacco.” Oriental tobacco is mainly used for blends of pipe and cigarette production.

Thuoc Lao is a nicotine-rich type of tobacco grown exclusively in Vietnam and is often smoked by Vietnamese rice farmers.

Wild tobacco is native to the Southwestern United States, Mexico, and other parts of South America. It is scientifically known as Nicotiana rustica and is commonly used for tobacco dust or pesticides.

Production levels

South Africa

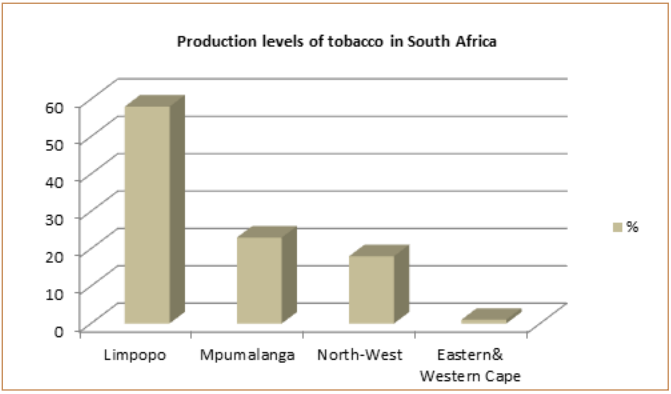

FIG. 1 Production levels and areas producing tobacco in South Africa
Source: *Tobacco SA/TISA*

The total production of tobacco in South Africa is estimated at about 28 000 to 30 000 tons. As a result of health issues associated with tobacco, total production has decreased. There are about 600 commercial tobacco growers in South Africa operating on approximately 13 800 hectares of land. Tobacco in South Africa is expected to continue to decline in volume terms over the forecast period. Potential changes restricting the advertising and marketing of tobacco products; such as changes to the amount of display space allowed in-store, the inclusion of graphic images on packaging and even further restrictions on smoking in public places, will all serve to place increased pressure on cigarette manufacturers.

Internationally

China was reported to be the biggest producer and exporter of tobacco. It is said that China produced and exported 54% of tobacco, followed by Brazil with 13%, India with 7%, USA with 5% and lastly Zimbabwe and the European Union each contributing 3%.

Major production areas of tobacco In South Africa

Tobacco is grown in the five provinces which include; Limpopo (Ellisras, Mokopane, Naboomspruit, and Sterkrivier); North West (Brits, Groot Marico

and Rustenburg); Mpumalanga (Loskop, Groblersdal and the Lowveld: Nelspruit and Barberton); Eastern Cape (Gamtoos Valley); and lastly in the Western Cape (Oudtshoorn). These production areas are classified according to the production of different types of tobacco. Flue-cured tobacco is produced mainly in three provinces, namely; Limpopo, Mpumalanga and North West, while air-cured tobacco is produced in the Eastern Cape, Western Cape, and the Limpopo and North West provinces.

Cultivars

There are various most commonly cultivated tobacco cultivars in South Africa which includes: KY14, Hicks, NC 2326, Burley 37, KY14xL8, Coker 371–Gold and Beinhart 1000–1. These cultivars are preferred in terms of their resistance to diseases and drought. There are also various types of tobacco grown in South Africa which includes: Virginia (Flue-cured) tobacco, Burley tobacco and Oriental tobacco.

Description of the plant

Mature plant

The tobacco plant has a thick, hairy stem and large, simple leaves which are oval in shape.

Leaves

Leaves and stems are covered with hairs, some of which produces white, cream, pink or

red flowers which grow in large clusters. Furthermore, the leaves are tubular in shape and can reach a height of up to 3,5 to 5,5 cm. The leaves are the essential parts, they are cured and processed to be used in the manufacturing of cigarette, pipe tobacco and the chewing tobacco.

Seed

The seeds are very small, and one plant usually produces 200,000 or more.

Root

The plant has a fibrous or adventitious root system.

Climatic requirements

Temperature

Tobacco is tropical in origin, but it is grown successfully under tropical, subtropical and temperate climates. Normally, it requires about 100 to 120 days, frost-free climate with an average temperature of 20 °C to 30 °C between transplanting and harvesting. In general, the tobacco plant is remarkably sensitive to the environment. Ideal conditions required for successful production of high-quality leaves are liberal and well-distributed rainfall during active vegetative growth stage, long day lengths, and mean temperature of 26 °C during the growing season and lastly, a relatively high humidity of 70–80%.

Rainfall

Tobacco requires an annual rainfall distribution of between 500 to 1,250 mm. However, excess water may result in the plant becoming thin and flaky. Therefore, tobacco should be ripening without heavy rainfall.

Soil requirements

Tobacco can be grown in almost every type of soil. However, best soils for tobacco production are deep, well-drained loamy soils with little or no risk of flooding. Despite tobacco being somewhat tolerant to drought, optimum

production is achieved from soils with high water-supply capacity. Soils with the rooting depth of at least 76,2 centimetres are preferred. Production has also been quite successful on soils with well-structured red clay sub-soils. Soils with tight, heavy clay sub-soils, very sandy and soils with rooting depth less than 76,2 centimetres should be avoided. Soils with clayey surfaces that tend to be cloddy when tilled may cause problems with transplant survival. Because of sensitivity to wet soils, tobacco should not be grown in fields that pond or flood in heavy rains. The optimum soil pH for tobacco production is about 5 to 6,5.

CULTIVATION PRACTICES

Soil preparation

The area or plots in which tobacco transplants are to be transplanted should be constantly exposed to the sun, well-drained and tilled. Soils, proven to have diseases and nematodes infestation should be avoided.

Planting and transplanting

The ideal time for planting is autumn (from February to April) under irrigation conditions, when adequate moisture is present, and a full summer is ahead for a quick canopy and optimum use of summer conditions. Under rain-fed conditions planting should be done from April to May. In the Midlands, planting should not go beyond October, as the vector for mosaic is active thereafter and rapid spread of the diseases may occur. Autumn planting is possible, but conditions must be favourable for germination before winter.

The seeds are sprinkled onto the surface of a sterile seed starter mix that is slightly watered. Starter mix is placed in a smaller flower pot, preferably with holes in the bottom. Seeds are grown indoors for a period of 4 to 6 weeks. Tobacco seeds are extremely small (not much larger than a pinprick), so they should not be sown too thickly. There should be adequate spacing between the seeds to avoid overcrowding. Tobacco seeds should be planted outdoors with warm temperature of about 24 °C to 27 °C for proper germination. Seeds should not be covered with soil since they need light to enhance germination; tobacco seed takes about 7–10 days to germinate.

Tobacco seedlings can be transplanted after 3–4 weeks. Transplanting tobacco plant bare-root (without soil) directly from the seedling pot to the land is an easier method, as it only involves one transplant. However, once the seedlings are planted into the soil they can go into a transplant shock.

Transplant shock result in leaves turning yellow and wilting. After a week, tobacco plant will begin to flourish again, especially if transplanting shock is avoided. Seedlings should be watered with plant starter fertiliser solution like Miracle-Gro or seaweed/fish emulsion fertiliser. If the plant begins to look yellow or stunted, another dose of fertiliser mix should be added. The plants should be at least 60,96 cm apart and distance between the rows should be 91,44 cm from each other.

Fertilisation

As a guide to the fertiliser requirement of tobacco, much emphasis should be placed on the nutrients uptake of a plant throughout the season. In particular, the amount of Potassium (K) taken up by the plant is very low in relation to the amounts typically applied. A large part of the applied nutrients remain in the soil when the crop is removed. The soil test is a valuable diagnostic tool for monitoring soil nutrient status and fertiliser requirement of tobacco. A soil test is helpful in determining the pH and availability of nutrients. A total fertiliser programme involves more than adding the recommended lime and nutrients. Careful consideration should be paid to residual nitrogen (N) leaching, placement and timing of nutrient applications. Over-fertilisation with N and certain micronutrients can decrease yield and quality of tobacco, increase production costs, and may adversely affect water quality.

Liming (pH, Calcium (Ca) and Magnesium (Mg)

The optimum pH for tobacco production is 5,7 to 6,0, although good growth can be obtained at higher and lower values depending on soil type. Dolomitic lime containing both Ca and Mg is recommended.

Nitrogen (N)

Nitrogen management affects yield and quality of tobacco more than any other nutrient. When plants suffer from nitrogen deficiency, yield will be reduced and cured leaves tend to be pale and slick with poor texture. While excessive N may slightly increase yields, it also stimulates excessive suckering, delays maturity, and may result in dark coloured, unripe cured leaf.

Nitrogen, (N), Phosphorous (P) and Potassium (K)

The most common grades of fertiliser have either a 1:0:3, 1:1:3, 1:2:3 or 1:3:3 ratio. With proper selection of the fertiliser ratio, the proper P rate can be applied without altering the rates of N and K.

Secondary nutrients

The secondary nutrients (Ca, Mg, and S) are often included in complete tobacco fertilisers. They may also be added using other readily available nutrient sources such as dolomitic lime (Ca, Mg), gypsum (Ca, S), and Potassium Magnesium Sulphate (K, Mg, S).

Irrigation

Irrigation is an important aspect in the production of good quality tobacco. Rainfall is unpredictable and generally unreliable during the critical growth period. Therefore, irrigation is typically used to supplement water needs during the periods where there is no rainfall. Too often, water is applied in a haphazard manner with little regard to the water needs of the crop. Research has indicated that underwatering as well as overwatering can significantly reduce both yield and quality of tobacco. It is important to apply the appropriate amount of water at the proper times..

Under conditions of inadequate soil moisture, tobacco can benefit from timely application of water in amounts to bring the soil moisture level up to or close to field capacity. Overapplication of irrigation should be avoided because of the wasteful nature of the use of excessive water and the possibility of negatively affecting yield and quality of the cured leaf by causing damage to the root system or leaching needed nutrients below the root zone and out of reach of the roots.

Weed control

Weed control is one of the most important aspects in the production practice of tobacco. Weeds compete with the plant for moisture and nutrients which may result in yield losses. In addition to reduced yields, weeds may also be a serious source of foreign material in mechanically harvested tobacco. Good weed control in tobacco is best achieved by utilising all available methods of weed control in an integrated programme which includes the following:

Sanitation

Many of the problem weeds in tobacco are the result of seed produced in the field during the preceding crops or seed blown into the field or onto plant beds from adjacent areas such as fence rows or ditch banks. Preventing

weeds from producing seed in these areas may aid in reducing weed problems in succeeding tobacco crops. Destroying weeds around the plant bed area, as well as utilising natural or artificial windbreaks, will reduce weed problems.

Crop rotation

Crop rotation can be beneficial in reduction of weed problems. Many weeds, especially the large-seeded broadleaf weeds such as sicklepod, cocklebur, and Florida beggarweed, can be more effectively controlled in other crops such as maize or sorghum. Controlling these weeds in a rotational crop reduces the weed seed available for germination in the tobacco crop.

Cultivation

Cultivation and occasional hand-hoeing have, and continue to be, an important part of a tobacco weed control programme. Currently, there are several weeds in tobacco that can be effectively controlled only by this method.

Chemical control

The use of herbicides in tobacco has become widely used in the control of weed. Good early-season weed control with herbicides can be extremely important in reducing competition and allowing the rapid establishment of tobacco, resulting in more effective cultivation. Labour requirements for hand hoeing and cultivation can be reduced by proper use of herbicides. Herbicides may supply some insurance against fields becoming weedy during wet periods following transplanting. All weeds do not respond the same to all herbicides; therefore, the weeds expected in the field should be known when planning a weed control program.

Pest control

There are several species of insects that poses serious threats to tobacco in the field, greenhouses, and the curing barn. Insects damages the roots, destroy the leaves and buds, reduce leaf quality, and transmit several important tobacco diseases. The integrated pest management (IPM) system is important in combining cultural, natural, and chemical controls in order to maintain insect pest population and promote the use of insecticides only when necessary.

Leave-eating insects

TOBACCO BUDWORMS (*HELIOTHIS VIRESCENS*)

Description: Tobacco budworm moths are light olive to brownish-olive, with a wingspan of about 32 mm. Each forewing bears three slanted, dark olive or brown bands. Hind wings are white with dark margins.

Damage: Tobacco budworms feed in the buds of young tobacco plants causing many holes in the tiny developing leaves. As the leaves grow, these feeding holes become larger and give the plants a ragged, distorted appearance. However, budworms sometimes top the plants prematurely; causing early sucker growth that may stunt the plants and require extra labour to remove the suckers. After the button stage, budworms rarely cause economic damage.

Control: Foliar sprays for budworm control with one or three solid-cone or hollow-cone nozzles can be used.

TOBACCO HORNWORMS (*MANDUCA SEXTA*)

Description: Tobacco hornworms are large caterpillars (up to 10,16 cm long).

Damage: Tobacco hornworms eat large amounts of tobacco leaf. Infestations may develop anytime from transplanting until harvest, but damage is usually most severe during August and September.

Control: Early topping, early transplanting, effective sucker control, and fertilisation with recommended rates of nitrogen help reduce late-season infestations. On a large space, stalk cutting and root destruction immediately after harvest reduce overwintering hornworm populations.

Aphids

Description: Tobacco aphid is the most severe pest for tobacco. Their population increases rapidly, doubling in size in about every two days under favourable conditions. High populations of aphids can reduce tobacco yield by 5–25% or more.

Aphids are tiny true bugs with piercing, sucking mouthparts designed to suck the juices from plants. They are usually wingless and pear-shaped. They can be recognised by the pair of cornicles projecting from their hind ends—two tiny "tailpipes" that other soft-bodied insects lack. They vary in colour according to species and host plants.

Tobacco aphid is the most severe pest for tobacco. Their population increases rapidly, doubling in size in about every two days under favourable conditions. High populations of aphids can reduce tobacco yield by 5-25% or more.

Damage: As aphids feed, they excrete honeydew that contains the excess sugars obtained from the plant sap. This sticky, shiny honeydew and tiny white exoskeletons are deposited on the leaves below the feeding aphids. A dark, sooty mold that gives the leaves a dark tint often grows on the honeydew. The combination of sooty mold and honeydew interferes with curing, reduces leaf quality, and often remains on tobacco after aphids have been controlled. Aphids are most severe on field tobacco from late June to September.

Control: Remedial applications of a foliar insecticide at the economic threshold level before populations become too high should be applied. Rotating insecticides with different modes of action reduces the chances that resistance will develop. When applying several insecticides for aphid control over the growing season, change from one group to another. It takes one to three days after application of most insecticides for the aphids to die.

Tobacco Flea Beetle (*Epitrix hiritipennis*)

Description: Tobacco Flea Beetle is a hard-shelled, black, very active beetle about 1,5 mm long. Wing covers have rows of fine distinct punctures. The eyes are black and the antennae 12-segmented.

Damage: Tobacco Flea Beetles feed on the leaves and stalks of tobacco, while the grubs or larvae feed on tobacco roots. Extensive feeding in both beetle stages on newly set transplants may cause stunting and uneven stands. When checking tobacco fields for Flea Beetles, look for the characteristic shot-hole feeding damage, and then count the beetles on 20 plants (two per field-sample location).

Control: Treatments for Flea Beetles on newly set tobacco should be applied when there are four or more beetles per plant. Larger plants can tolerate very high Flea Beetle densities. An insecticide should be applied when the base of the lower leaves have a netted appearance or densities exceed 60 beetles per plant. The most effective cultural practices for reducing Flea Beetle damage are harvesting at the normal time and stalk cutting and root destruction immediately after the last harvest. Tobacco with nitrogen deficiency appears to be more susceptible to Flea Beetle damage after topping. Flea Beetles are difficult to control after topping because the insecticides that can be used at this time provide only short residual control and Flea Beetles are emerging from the soil over an extended period.

Tobacco splitworm

Description: The tobacco splitworm, or potato tuberworm, is a leaf-mining caterpillar that is sometimes a late-season problem on tobacco.

Damage: Splitworms live in tunnels or mines that appear as greyish, translucent blotches on the leaves. Splitworms can also feed in the midvein and stalk. Old mines turn brown and brittle and may destroy over 50% of the leaf. Although the mines are most common on the lower leaves, they can occur on any leaf. Splitworm damage increases the amount of dead leaf tissue and may reduce crop yield and value.

Control: Since splitworms feed within the leaves, they are difficult to control with insecticides. Currently, no insecticides are registered for splitworm control on tobacco. Therefore, it is important to avoid planting or storing Irish potatoes near tobacco fields because they are an important source of this pest. If splitworm mines are observed on the lower leaves, the leaves should be harvested and cured as soon as possible. Since splitworms continue to develop inside the leaves after they are harvested, removing infested leaves and dropping them on the ground will not reduce the problem and may make it worse.

Nematodes

Damage: Plant parasitic nematodes can be found wherever tobacco is grown. The severity of the damage they cause may depend on climate and soil type. Damage caused by nematodes are

difficult to estimate because damage to roots may not be apparent in above ground symptoms, yet significant reductions in yields can occur with moderate levels of nematodes. Nematodes may increase the incidence of other diseases such as black shank, bacterial wilt and Fusarium wilt. The most important nematodes on tobacco are the root-knot nematodes. The most prevalent is the southern root-knot nematode, *Meloidogyne incognita*. However, another species (*M. arenaria*) also infests some fields. *Meloidogyne arenaria* (sometimes called peanut root-knot) is important because it is very damaging to tobacco and there is presently no resistance to this pest. Varieties that are resistant to the southern root-knot (*M. incognita*) are not resistant to *M. arenaria*.

Control: Rotation is effective for both root-knot species and again should provide the basis for management of nematodes. Nematicides may also be effective in reducing nematode numbers in soil. It is best to base the control strategy on rotation, using resistant varieties when appropriate and nematicide treatments to supplement the rotation strategy. If rotation cannot be practiced, or only short rotations (1 year) are utilised, the use of nematicides and resistance becomes essential. Combining rotation, resistant varieties, and nematicides or fumigants are the best control practices.

Disease control

Granville wilt

Granville wilt is caused by bacterium (*Pseudomonas solanacearum*). The disease is most damaging in fields where tobacco has been grown the previous year and in wet areas of fields.

Symptoms: The plant begins to wilt and eventually dies off.
If the plant does not die off, growth is usually stunted with twisted and distorted leaves.
The stalk of the plant turns black, especially at the soil line

Control: One of the most important management strategies for Granville wilt is crop rotation because the bacteria that cause the disease do not survive well in the absence of the tobacco host plant.
Planting of resistant varieties.

Alternaria leaf spot (Brown spot)

Alternaria leaf spot (Brown spot) is a fungal disease caused by (*Alternaria alternate*). Disease emergence favors warm, wet weather and excessive fertilisation can cause greater crop losses.

Symptoms: Small, circular, target-like spots on lower leaves.
Lesions are usually surrounded by a bright yellow halo and enlarged.
When variety of tobacco being grown is susceptible to the disease, then spots may also appear on stalks and suckers.

Control: Rotating crop away from tobacco can help to reduce the levels of inoculums in a field. Stalks and roots left after harvest should be removed and destroyed.
Nematodes in the soils should be controlled.
Ensure plants have adequate potassium available to promote vigorous growth.

Collar rot

Collar rot is a fungal disease caused by (Sclerotinia sclerotiorum). It causes a serious problem of glasshouse grown tobacco plants.

Symptoms: Water-soaked, soft, green, lesion at base of stem.
Black fungal structures develop out of the white fungal growth.

Control: Reduce build-up of moisture in glasshouses by increasing ventilation and air circulation. Increase frequency of leaf clipping and reduce the amount of leaves removed at each clipping. Avoid injuries to the seedlings.

Fusarium wilt

Fusarium wiltanae is not common but can cause damage where it occurs.

Symptoms: Symptoms usually develop on one side of the plant with distinctive leaf yellowing and drying.
The outer bark peels off, revealing a brown to black discoloration in the woody stem cylinder.

Control: Infested side should be abandoned.
Crop rotations with forage grasses or small grains are recommended. Treatment with multipurpose fumigants and resistant varieties are recommended.

Black shank

Black shank is caused by the fungus *Phytophthora parasitica* var. nicotianae. It is favoured by wet spring weather.

Symptoms: Typically, black shank results in extensive root rotting, pith disking and decomposition, and blackening on the outer surface of the stalk.

Control: Resistant cultivars should be planted.
Crop rotation

Tobacco mosaic virus (TMV)

Tobacco mosaic virus is a viral disease. It can be spread by farming equipment and by hands that have come into contact with cigarettes or other tobacco products.

Symptoms: Alternating light and dark green patches appears on the leaves.
Leaves turn brown and dry out.

Control: Tobacco resistant varieties should be planted.
Infected plants should be removed and destroyed.
Hands should be washed thoroughly after use of tobacco products before handling plants; avoid having tobacco products on person when working with tobacco plants.

Harvesting

Tobacco should only be harvested when it has reached its maturity and it has ripened. Burley tobacco usually matures and is ready for harvest 3 to 5 weeks after topping, at which time the upper third part of the plant should have a distinct pale green to yellow appearance, and the bottom part of the plant is completely yellow. The midribs of the leaves should fade from a green colour to a pale yellow colour as the plant ripens. Different varieties of tobacco differ in the time of maturity or ripening. However, added growth and weight of the upper leaves will usually more than make up for the loss of down-stalk leaves.

Harvesting methods

Tobacco is generally harvested in one of two ways. The oldest known method in use is simply cutting off the stalk at the ground using a curved knife. They start to harvest the tobacco plant by pulling individual leaves off the stalk as they ripen; tobacco leaves ripen from the ground upward, so the

tobacco plant may be pulled several different times before the tobacco plant is entirely harvested. This is also known as “Cropping” or “Priming.’’ These are terms used for pulling leaves off tobacco. The first crop at the very bottom of the stalks are called “sand lugs” as they are often against the ground and are coated with dirt splashed up when it rains.

POST-HARVEST HANDLING

Storage

Curing

After tobacco has been harvested, it is necessary to cure it before consumption. Tobacco curing is also known as colour curing because when tobacco leaves are cured, the intention is to change their colour and reduce their chlorophyll content. Curing of tobacco is not a simple drying process but involves a series of physical and chemical changes that begin when the plant is cut and ends when the plant is dry. The major steps in the curing process include wilting, yellowing, browning or colouring and drying. The entire process requires six to eight weeks. Optimum curing conditions occur when temperature is in the general range of 17 °C to 32 °C and relative humidity is 70–75%. In the early stages of curing, it is impractical to attempt to maintain these optimum ranges through a period of 24 hours. In normal weather, the humidity within a barn filled with green tobacco will approach 100% each night. A good cure can still be obtained if ventilation is provided to dry out the barn the next day.

Curing methods vary with the type of tobacco grown, and tobacco barn design varies accordingly:

Air

Air-cured tobacco is hung in well-ventilated barns and allowed to dry over a period of four to eight weeks. Air-cured tobacco is low in sugar, which gives the tobacco smoke a light, sweet flavour, and high nicotine content. Cigar and burley tobaccos are air cured.

Fire

Fire-cured tobacco is hung in large barns where fires of hardwoods are kept on continuous or intermittent low smoulder and takes between three days and ten weeks, depending on the process and the tobacco. Fire curing produces a tobacco low in sugar and high in nicotine. Pipe tobacco, chewing tobacco, and snuff are fire cured.

Flue

Flue-cured tobacco was originally strung onto tobacco sticks, which were hung from tier poles in curing barns. These barns have flues which run from externally fed fire boxes, heat-curing the tobacco without exposing it to smoke, slowly raising the temperature over the course of the curing. The process will generally take about a week. This method produces cigarette tobacco that is high in sugar and has medium to high levels of nicotine. The Smith Tobacco Barn is an example of a traditional, flue-cured tobacco barn.

Sun

Sun-cured tobacco dries uncovered in the sun. This method is used in Turkey, Greece, Bulgaria, Macedonia, Romania and Mediterranean countries to produce oriental tobacco. Sun-cured tobacco is low in sugar and nicotine and is used in cigarettes. In India sun curing is used to produce so-called “white” snuffs, which are fine, dry, and unusually potent.

Grading

Stripping the leaves from the stalk and sorting into groups enables leaf buyers to obtain the specific grades needed by the manufacturer. If tobacco leaves are not properly separated by stalk position, quality is sacrificed and the overall sustainability tobacco production is weakened. Generally there are four distinguishable grades of tobacco on a stalk. These grades include Flyings (X), Lugs (C), Leaf (B), and Tips (T). The flying group (X) consists of leaves grown at the bottom of the stalk. These leaves are flat and have a blunt of oblate tip. They are relatively thin bodied and show a certain amount of injury. The lug group (C) consists of leaves which grow above the flyings and up to about midportion of the stalk. These leaves have a rounded tip and, when cured, have a tendency to fold and conceal the midrib. They are thin to medium bodied. The leaf group (B) is made up of leaves grown above the lugs. The cured leaves, especially from the upper stalk position, have a

tendency to fold and conceal the face of the leaf. These leaves are medium to heavy bodied. The tips (T) are those top 3 or 4 leaves at the top of the stalk.

Market structure

Domestic market and prices

Approximately 40–45% of flue-cured tobacco and 60–70% of air-cured tobacco is used for local consumption. Finished tobacco products are distributed through 364 wholesalers, 55 000 retailers and approximately 60 000 small players in the informal market (street vendors, spaza shops, etc.).

Exports volumes

South Africa exports an average of 16 000 tons of leaf tobacco per annum. This represents between 50-60% of leaf tobacco that is produced annually. Flue-cured tobacco that is not used for local consumption is exported mainly to Europe, the Middle East, the Far East and other African countries. Tobacco qualifies for duty free access to the USA under the African Growth and Opportunities Act. Over the past ten years, the major export market for tobacco from South Africa to the SADC region was Zimbabwe, with very intermittent exports to Malawi, Mozambique, The United Republic of Tanzania and Zambia. South Africa also exported about 792,11 tons of tobacco to Asia in 2011. Furthermore, the major export market for tobacco exports from South Africa to Europe was the European Union, followed by Eastern Europe. In 2011, approximately 208,49 tons of tobacco was exported from South Africa to the European Union. The major export market for tobacco from Europe was Sweden, followed by Belgium and Greece buying approximately 196,20 tons of tobacco.

UTILISATION

Tobacco is a controlled substance due to its habit-forming characteristics. It can be chewed, smoked or even snorted. It has been smoked for centuries, starting with Native Americans and spreading into Europe and beyond. It has also been used as a traditional medicine in

treating insect bites and cuts. Furthermore, tobacco can also be turned into nicotine tartrate which can be used in medicine. As a result of nicotine's lethality to insects it has been used as a pesticide in agriculture.

PRODUCTION SCHEDULE

A basic tobacco production schedule is as indicated below

Activities	January	February	March	April	May	June	July	August	September	October	November	December
Soil sampling					X						X	
Soil preparation						X						X
Planting			X	X				X	X			
Fertilisation			X	X	X							
Irrigation							X	X				
Pest control							X					
Disease control							X					
Weed control				X	X				X	X		
Harvesting								X	X	X		
Marketing	X	X										

REFERENCES

www.tobaccosa.co.za

www.batsa.co.za

http://www.hort.purdue.edu/newcrop/Crops/Tobacco.html e.g.

http://pubs.ext.vt.edu/436/436-050-08/PDF_436-050.pdf

http://www.who.int/tobacco/en/atlas16.pdf

http://ipm.ncsu.edu/Production_Guides/Flue-cured/flue_cured.pdf

NOTES

Further information can be obtained from

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