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Prepare a business plan on a chosen agricultural enterprise

Maize is a cereal crop that is grown widely throughout the world in a range of agro ecological environments. More maize is produced annually than any other grain. About 50 species exist and consist of different colors, textures and grain shapes and sizes. White, yellow and red are the most common types. The white and yellow varieties are preferred by most people depending on the region.

Maize was introduced into Africa in the 1500s and has since become one of Africa's dominant food crops. Like many other regions, it is consumed as a vegetable although it is a grain crop. The grains are rich in vitamins A, C and E, carbohydrates, and essential minerals, and contain 9% protein. They are also rich in dietary fiber and calories which are a good source of energy.

Importance

Maize is the most important cereal crop in sub-Saharan Africa (SSA) and an important staple food for more than 1.2 billion people in SSA and Latin America. All parts of the crop can be used for food and non-food products. In industrialized countries, maize is largely used as livestock feed and as a raw material for industrial products. Maize accounts for 30–50% of low-income household expenditures in Eastern and Southern Africa. A heavy reliance on maize in the diet, however, can lead to malnutrition and vitamin deficiency diseases such as night blindness and kwashiorkor.

Production

Worldwide production of maize is 785 million tons, with the largest producer, the United States, producing 42%. Africa produces 6.5% and the largest African producer is Nigeria with nearly 8 million tons, followed by South Africa. Africa imports 28% of the required maize from countries outside the continent. Most maize production in Africa is rain fed. Irregular rainfall can trigger famines during occasional droughts.

Consumption

Worldwide consumption of maize is more than 116 million tons, with Africa consuming 30% and SSA 21%. However, Lesotho has the largest consumption per capita with 174 kg per year. Eastern and Southern Africa uses 85% of its production as food, while Africa as a whole uses 95%, compared to other world regions that use most of its maize as animal feed. Ninety percent of white maize consumption is in Africa and Central America. It fetches premium prices in Southern Africa where it represents the main staple food. Yellow maize is preferred in most parts of South America and the Caribbean. Maize is processed and prepared in various forms depending on the country. Ground maize is prepared into porridge in Eastern and Southern Africa, while maize flour is prepared into porridge in West Africa. Ground maize is also fried or baked in many countries. In all parts of Africa, green (fresh) maize is boiled or roasted on its cob and served as a snack. Popcorn is also a popular snack.

Choice of Land

Any well drained sandy loam or loamy soil can be used for planting maize but if in doubt, contact your nearest Extension Office or Agro-Service Center.

- If the soil is moist, plant 2-3 cm below the ground and if the soil is dry, plant the seed 5-10 cm deep so that it does not dry up.
- The depth of planting should be uniform to allow uniform plant germination and growth.
- Plant using a planter such as a hand-held jab planter or ox- or tractor-drawn tractor to ensure uniform depth of planting.
- When using a planter check the first few lines to ensure that the planting is okay and adjust where necessary.

Choosing a variety

Variety selection can have a significant bearing on the return on investment (ROI) from growing maize for silage. The area of maize grown for silage is predicted to rise as more dairy farmers look to increase dependence on forage to insulate their business from feed price volatility.

Recommended Varieties

EARLY SEASON

YELLOW OPEN-POLLINATED VARIETIES

Western Yellow 1: TZSR-Y-1 (Streak Resistant) DMR-LSRY (Downy Mildew & Streak Resistant) YELLOW HYBRID VARIETIES: 8425-8; 8329-15 WHITE, OPEN-POLLINATED VARIETIES: TZPB (FARZ 27); TZB (FARZ 34); TZSR-W-1; ZPBSR (Streak Resistant); DMR LSRW (Downy Mildew & Streak Resistant). DMR-LSRW (Downy Mildew & Streak Resistant).

WHITE HYBRIDS 8321-18; 9022-19; (Striga Resistant).

LATE SEASON

Plant early maturing, streak and/or downy mildew resistant varieties.

YELLOW OPEN-POLLINATED VARIETIES: TZESR-Y; DMR-ESRY (Downy Mildew and Streak Resistant). WHITE-OPEN POLLINATED VARIETIES: TZESR-W; DMR-ESRW (Downy Mildew and Streak Resistant) POPCORN: White Pop: Yellow composite.

Acquisition of planting material

The GGDP also supported a number of activities designed to improve the transfer of improved technologies generated through the project to farmers. The strong emphasis on technology transfer issues was reflected in three types of activities:

- (1) Building linkages between research and extension,
- (2) Providing support to extension activities, and
- (3) Strengthening seed production capacity

Stem quality

Nitrogen fertilizer was applied to corn (*Zea mays* L.) at conventional (excessive) and recommended levels, and the growth response was assessed by measuring plant height and stem perimeter. Corn plant maximum height was observed in recommended rates of Nitrogen fertilizer treatment, and the height without Nitrogen fertilizer was the same as that receiving excess Nitrogen fertilizer. Stem perimeter was greatest in the treatment with recommended levels of Nitrogen fertilizer, followed by the excess Nitrogen fertilizer treatment. Greater increases in stem perimeter and plant height were observed after application of fertilizer at recommended rates, compared to control without Nitrogen fertilizer and treatment with excessive Nitrogen fertilizer, showing that application of Nitrogen fertilizer at recommended rates results in better growth

than that observed after application of fertilizer at excessive rates (i.e. those used in local farming practice). This shows that soil testing to determine appropriate rates of fertilizer application can reduce fertilizer application rates by more than 50%, while retaining optimum growth in plant height and stem perimeter. Therefore, decreasing application of fertilizer is feasible to reduce environmental pollution and the cost of agriculture.

Time of Planting

EARLY SEASON

- (i) In the Forest zone, the optimum planting date is between 15 March and 1 April, although planting could be done as soon as rainfall becomes steady.
- (ii) In the Derived Savannah zone, plant as soon as the rainfall becomes steady, between 1-30 Aprils.
- (iii) In the Southern Guinea Savannah zone, planting could still be done as late as May and June, depending on rainfall.

PLANT POPULATION

- (i) Open-Pollinated/Popcorn varieties: Hand planted, 90 cm x 40 cm, 2 plants/stand to give 55,555 plants/ha.
- (ii) Hybrids: Hand planted, 90 cm x 40 cm, 2 plants/stand to give 55,555 plant/ha.
- (iii) Mechanical Planting: (Any Variety) 75 cm x 25 cm, 1 plant/stand to given 53,555 plants/ha or 90 cm x 20 cm, 1plant/stand giving 55,555 plants/ha. There should be no thinning or supplying except in very bad cases.

N.B. Always use certified seeds of recommended varieties for good crop establishment.

Chemical Control

HAND WEEDING

Carry out the first weeding 14–21 days after planting or as soon as necessary. A second weeding may be done if necessary before the second application of fertilizer.

Apply Atrazine pre-emergence at the rate of 3 kg a on a clean seed bed. 4 For 50% flow able (PW), rate is 3.0 kg active ingredient per hectare. (Local unit is 1 small tomato tin full/4.5 liters (1 gallon) of water. For type 80% wet table powder, rate is 3.0 kg active ingredient per hectare. Local unit is approximately one standard match box full/4.5

liters (1 gallon) of water. Volume of Water to be used: Ideally, the sprayer should be calibrated to determine the spray volume.

Fertilizer rate and time of application

For every high yields, apply 600 kg (12 bags) of 25:10:10 per hectare in two splits at planting (200 kg) and 5 to 6 weeks after planting (400 kg), to give 150 kg N, 60 kg P₂O₅ and 60 kg K₂O per hectare. In the savanna zone, add 200 kg (2 bags) of Single Superphosphate and 5kg of Zinc Sulphate to give a total of 150 kg N, 78 kg P₂O₅, 60 kg K₂O, 14 kg S and 2 kg Zn. Alternatively, apply 500 kg (10 bags) of 20:10:10-2S-1Zn/ha at planting and a second dose of 100 kg (2 bags) of Urea per hectare.

LATE SEASON

Fertilizer rate and time of application are the same as for early season

Harvesting

According to 2007 FAO estimates, 158 million hectares of maize are harvested worldwide. Africa harvests 29 million hectares, with Nigeria, the largest producer in SSA, harvesting 3%, followed by Tanzanian.

Disease

Various species of stem borers rank as the most devastating maize pests in SSA. They can cause 20-40% losses during cultivation and 30-90% losses postharvest and during storage. Other pests in SSA include ear borers, armyworms, cutworms, grain moths, beetles, weevils, grain borers, rootworms, and white grubs. The parasitic Striga weed is another maize pest. In fact, weed-related yield losses ranging from 65 to 92% have been recorded in the Nigerian savanna. Maize diseases in SSA include downy mildew, rust, leaf blight, stalk and ear rots, leaf spot, and maize streak virus (MSV). Maize does not tolerate drought well and the grain can rot during storage in tropical climates. A lack of sunshine and nitrogen can reduce the production potential of the crop.

Pest

Stemborerers, army worms and grasshoppers, termites, corn earworm.