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Management Practices for Improved Sorghum Production in the Savanna Zones of Nigeria

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Abstract: *Although, it is used to be difficult in convincing farmers to adopt modern cultural practices in crop production, especially in proper fertilizer application and the method of application in addition to the use of proper inter and intra-row spacing in crop production. Attempt is made in this paper to discuss some management practices such as site selection, Land preparation, seed dressing, fertilizer application, weed control, pests, diseases and their control methods together with some suggestions for interested individual wishing to embark in sorghum production for better growth, development and yield of the crop.*

Keywords: *Management Practices,Sorghum, Savanna, Production*

INTRODUCTION

Even though, Sorghum (guineacorn) is considered to be the fourth most important among cereal in the areas of cultivation worldwide, apart from wheat, rice, and maize. It is the most important cereal crop in Nigeria occupying about 46% of the total land area devoted to the growing of cereals. It account for about 50% of the total cereal produce in Nigeria (Kochhar, 1986).

Just as the area devoted to the growing of sorghum has increased, so also its production. The total hectarage of land in the world under sorghum cultivation in 1959 was just 4.6million hectares, which rose to about 50.8 million hectares in 1979 (Kochhar, 1986).

The institute for Agricultural Research (IAR) Ahmadu Bello University Samaru Zaria has made numerous achievements in increasing the yield of sorghum. Evidence still exists that yield can be substantially increased from the present yield/hectare recorded from most Nigerian farms which ranges from 1-2 tonnes per hectare. (Nigerian Educational Research and Development Council, 1991) by the use of improved varieties and good management practices.

Management practices for the improved sorghum production in the savanna zones of Nigeria will be discussed under the following sub headings:

(a) Cultural practices
(b) Crop protection

Cultural Practices

(a) Site Selection: Sorghum tolerates a wide range of soil condition ranging from light sandy soils to heavy day. It tolerate a pH range between 5.0 to 8.7 as well as (salty) saline soils. (NERDC, 1991). Good soil fertility, good drainage along with favourable temperature are the most important considerations in the choice of land for successful sorghum production.

(b) Land preparation: A well prepared seed bed is an essential factor in sorghum production for obtaining maximum yield. This can be achieved by preparing well-constructed ridges so as to enhance growth and development of sorghum and minimize the following problems.

(i) Water logging on poorly drained areas
(ii) Different treatment for different crops grown on the same piece of land
(iii) The difficulties of carrying out some operations like hoe weeding on ridges.

(c) Seed Dressing: Seed dressing is an important operation for successful sorghum production. Sorghum seed should be dressed with Aldrex-T or Fernasan D so as to help prevent seed decay before germination and smut disease after germination which consequently reduce yield.

Time of Planting

Time of planting has effect on the yield of sorghum. It is govern mainly by pattern on set of rain. Since the time of commencement of rain is not the same in the four ecological zones, one will expect the time of planting to be different. Hence, farmers should plant when rain is well established and immediately after a good rain as ant delay will result in the decrease in yield.

However, in the southern guinea savanna where the duration of the rain is longest, planting too early may result to the sorghum during rains. This means that harvesting has to be done during the rain. Even though, good quality grain may be obtained, the risk of mouldy heads is intensified.

The table below shows the effects of planting date on sorghum yield.

Table 1: Effect of planting date on sorghum yield

Planting date	Grain yield (kg/ha)
2nd May	2836
14th May	4324
28th May	3646
12th June	2341
26th June	1792

Sources: IAR, report to the Board of Governors 1974-1976

Recommended Varieties for different Ecological zones

The importance of identifying the recommended variety for each ecological zone cannot be over emphasized for successful sorghum production. The helps farmers to know the variety suited to their ecological zone assisting in increased productivity.

The table below shows different location and the varieties recommended for each of the locations.

Table 2: Location and recommended varieties

Location	Strains released	Name
Entire Borno State	HP3	K.SV 3
Entire Yobe State	HP-3	K.SV 3
Gumel and Danbatta	BES 3	KSV 4
Hadeja Area	L 235	KSV 4
Entire Katsina State	L 2250	K.S V 12
Sokoto, B. Kebbi and Argungu	L 2250	KS V 12
Jega Area	KBLL	K S V 5
Gusau	R Z 1	K S V 6
Kafin Soli area (KT)	KL538 BES	K S V 7
Potiskum, Bama, Fika areas	KL 187	K S V 3
Bauchi	SK5912	SSV 3
Gombe	SK5912	SSV 6
Malumfashi and Daudawa area	L1499	SSV 7
Samaru and Shika area	L 243	SSV 9

Sources: AERLS EXTENSION BULLETIN NO:1. 1985

Spacing:

Ridges are constructed 70-75 apart and provide about 25-30cm space between strands. However, wider intra-row spacing may be necessary in drier areas for more efficient use of limited moisture. Agricultural extension and Research liaison services (AERLS 1985).Thinning:

For high yield, sorghum should be thinned to two plants per stand in about two weeks after germination. It is advisable to thin immediately after good rain. Weak plants are thin leaving stronger ones to utilize the available moisture and nutrients for better growth and development.

Fertilizer application

The amount of fertilizer to apply depends on the soil type and soil need to be derived by analysis and practical test for the cropping area.

However, recent Research finding by institute for Agricultural research samara, Recommended 64kg of Nitrogen/ha and 32kg/ha of phosphorous (P_2O5) per hectare. However, areas with high sandy soil, like Sudan and Northern guinea savanna are mostly deficient in potassium. Therefore, 30kg of K_2O is recommended per hectare in addition to Nitrogen and Phosphorous.

The above requirement can be met by the application of 4½ bags of N.P.K., or 2½ bags of CAN, or 1½ bags of Urea in two split doses per hectare at 2 and 4 weeks after planting.

Compost and farm yard manure can also be applied to improve nutrients availability and soil physical properties.

Weed control

Weeds (unwanted plants) if left uncontrolled in sorghum field can lead to abandoning the farm and 100% loss. Despite the fact that the farm needs to be kept clean in the early stage of growth to enhance good development. Two weedings are recommended for better growth development and yield of sorghum.

Pests, Diseases and their Control Methods

Pests and disease if left uncontrolled will adversely affect the growth and development of sorghum resulting to low yield per unit area.

There are three general groups of diseases attacking sorghum, these are;

A- Those attacking the leaves reducing their foliage value and their potential for high yield.

B- Those causing seed rot and retard their germination or kill the seedlings.

C- Those causing roots and stalks rot resulting to lodging, poor head development, pre-mature ripening and poor seed set.

To control the above mentioned diseases in order to improve the high yield in sorghum, the following management practices can be adopted.

(i) Seed Treatment: Proper treatment of sorghum seed with Aldrex-T or fernasan 'D', will improve germination stands by reducing seed rot and seedling diseases. Spores of loose and covered smuts of sorghum seed will therefore be controlled.

(ii)Rogueing for Smuts (Removing plant infected by smut), All plants with smut diseases that cover the dead or panide should be removed from the farm and burnt or buried. In case of sporadic infection, rogueing is discouraged. But grains from this field should not be used for seed in planting next season.

(iii) Crop Rotation: Crop rotation for at least three years with crop resistant to sorghum diseases should be practical to minimize losses from seedlings, leaves, roots and stalks diseases. The crop that can be used in the rotation can be Cotton, Groundnut or any other non-related specie for sorghum.

Field Pests of Sorghum

Some of the most common pests of sorghum in the field include:

(i) Sorghum midge: This insect pests attack the sorghum panicle. The larvae feeds on the ovary and cause it to shrivel without forming grain. Early planting so that flowering can be completed before the midge population reaches peak (that is damaging level) is an effective control method.

(ii) Stem Borer: This insect pest bores hole to sorghum stem causing lodging of the plant and prevent the formation of heads. For easy control of this pest, the residues from the infected field should be destroyed to avoid the carryover of the problem to the next growing season.

Harvesting

The time of harvesting varies depending on the variety cultivated. In any case, harvesting should be done after the crop is mature. The stalk are cut and laid such that the head may have maximum aeration.

It takes about one-two weeks after harvesting to dry depending on the water content of the seeds and the weather conditions. When the moisture content is about 14%, the heads can be cut and tied to bundles, the form in which sorghum is stored by the majority of farmers in northern Nigeria.

Recommendation and Conclusion

The following are some suggestions recommended for achieving good management practices for increase yield in sorghum production.

(i) Government, its agricultural agencies and institutions should put more effort in public enlightment on adopting practices such as seed dressing, crop rotation and rogueing of infected plants.

(ii) Government should give more encouragement to local production of chemicals inputs (seed dressing chemicals, herbicides, insecticides) by increasing the import duties of such chemicals.
(iii) Government should provide more subsidies to farmers on farm inputs such as fertilizers, farm machineries etc.
(iv) Government should employ more extension workers and provide them with means of transportation to enable them visit farmers in all areas of production.

In conclusion, when the extent to which adopting good management practices can result to increase yield in sorghum production is considered, government should sensitized its various Agricultural Development Agencies and Institutions to work hard towards meeting the task motivating farmers to adopt these practices.

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