



International Journal of Sciences: Basic and Applied Research (IJSBAR)

ISSN 2307-4531
(Print & Online)

<http://gssrr.org/index.php?journal=JournalOfBasicAndApplied>



Influence of Agronomic Practices on Crop Production

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Abstract

The ultimate goal of any farmer is to get maximum yield per unit area. To obtain high yield, effective crop management practices, appeared to be of paramount value. Crop production in Nigeria is faced with many challenges among which are: untimely planting, incorrect plant spacing, wrong method of planting, poor sowing depth, delayed weeding, ineffective pests and diseases control, inappropriate use of fertilizers, untimely harvesting and above all usage of low yielding varieties of seeds. Such poor crop management practices become reflected in reduced crop growth and yield which invariably make farming to be physically strenuous and economically unrewarding in nature. In Nigeria, however, crop production is lagging behind in terms of yield per hectare due to the problems associated with poor crop management practices. This is justifiable considering the report by OLAM on sesame production in Jigawa State in which the average seed yield of sesame on farmer's field was put at 0.6t/ha as opposed to 1.25t/ha that is practically obtainable on well-managed farms. The low yield on farmer's field could be ascribed to failure of the farmers to adopt and practice the recommended agronomic practices that govern the production of the crop. Each crop has an established cultural practice that guides its production developed by crop scientists through a series of experimentations, and for the inherent yield potential of that crop to be fully expressed, such management practices must be properly adopted. Therefore, it is important to sensitize farmers and create awareness on the benefits associated with effective crop management practices so as to ensure sustainable food security and economic viability of the peasant farmers.

Keywords: Farmer; Yield; crop; Production, practices.

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1. Introduction

In crop production, the ultimate goal of any farmer is to get maximum yield per unit area. To obtain high yield, effective crop management practices, which are otherwise known as cultural practices, appeared to be of paramount value. Cultural practices simply refer to all the operations carried out in the farm, right from the beginning of the farming season to the end [1].

In Nigeria, however, crop production is lagging behind in terms of yield per hectare compared to International standard, perhaps due to the problems associated with poor crop management practices [2]. This is quite justifiable considering the report by [3] on sesame production in Jigawa State in which the average seed yield of sesame on farmer's field was put at 0.6t/ha as opposed to 1.25t/ha that is practically obtainable on well-managed farms. The low seed yield of sesame observed on farmer's field could be ascribed to failure of the farmers to adopt and practice the recommended agronomic practices that govern the production of the said crop.

In fact, each crop has an established cultural practice that guides its production, which were developed by crop scientists through a series of experimentations. And for the inherent yield potential of that crop to be fully expressed, such management practices must be properly adopted and carried out accordingly. It is therefore, against this background that, this paper is prepared with a view to sensitize farmers and create awareness on the benefits associated with effective crop management practices so as to ensure sustainable food security and economic viability of the peasant farmers within and outside the state.

Crop production in Nigeria is faced with many challenges among which are: untimely planting, incorrect plant spacing, wrong method of planting, poor sowing depth, delayed weeding, ineffective pests and diseases control, inappropriate use of fertilizers, untimely harvesting and above all usage of low yielding varieties of seeds. More often than not, such poor crop management practices become reflected in reduced crop growth and yield which invariably make farming to be physically strenuous and economically unrewarding in nature.

With poor crop management practices being one of the possible reasons responsible for low yield of crop in the country, it was envisaged that, refreshing the memories of readers and creating awareness on the obvious advantages associated with sound crop management practices will yield handsome dividends in this direction.

2. Material and Method

In preparing this paper, secondary sources of data such as books, journals, seminar papers, training manuals etc were reviewed or rather consulted.

3. Discussion

In agricultural sense, cultural practices refer to all the operations carried out in the farm, right from the beginning of the farming season to the end [1]. He further classified cultural practices into pre-planting, planting and post planting operations.

Pre-planting operations: - These are the operations carried out in the farm before planting is done which include the following:

Site Selection:- This is very important in crop production as soil type determines not only the kind of crop to be grown in an area but also the performance of the crop. For example, maize thrives well in sandy loam soil while cassava performs better in loamy soil.

Land Clearing:- Clearing of existing vegetation so as to make cultivation and other farm operations easy. It can be done manually or mechanically.

Stumping:- Removing the stumps or the underground portion of the plants, right from the base of their roots. It is done to make the use of tractor-coupled implements like plough, harrow and ridger easy and practicable.

Ploughing:- Breaking the soil to loosen it for easy penetration of roots, soil aeration, water percolation and create a suitable medium for microbial activities within the soil.

Harrowing:- it is the act of breaking up the large clods or particles of soil resulting from ploughing into a fine particles. Harrowing mixes the soil together and destroys weed seeds.

Ridging:- This is the process of making ridges. Ridges increase crop yield by promoting moisture retention and easy root penetration into the soil [4].

Seed Selection:- In crop production, the first step in attaining good harvest is the use of good quality seeds [5]. Certified seeds from a reliable seed company should be selected for planting as seeds of poor quality result in poor harvest.

Organic Manuring:- As opposed to inorganic fertilizers, organic manures are usually incorporated into the soil prior to planting as they decompose gradually and release nutrients into the soil [6].

Planting Operations:- These are the operations carried out in the farm during planting which include plant spacing, seed rate and planting itself.

Planting *Spacing:- This is the distance between two plants. The distance between one plant and another along the same ridge or row is called intra or within row spacing, while the distance between one plant and another on different ridges or row is known as inter or between row spacing. The spacing at which crop is planted determines

plant population per unit area, seed rate, plant competition for limited environmental resources, interception of solar radiation, weed suppression and the yield per unit area [7]. Reference [5] reported that, each crop has an optimum plant density at which it produces maximum yield, below or above this point yield becomes negatively affected.

Seed Rate:- This refers to the quantity of seeds or planting materials required to cover the planting of an area. To

determine seed rate of a given area, the area of the land, the actual spacing and the number of seeds per hole must be known. Assuming that, we want to plant a crop in a piece of land which is 200m long and 100m wide. If the spacing is 2m by 2m and 3 seeds are to be planted per hole, then the seed rate can be determine as follows:

$$\begin{aligned}\text{Area of the land} &= \text{length} \times \text{breath} \\ &= 200\text{m} \times 100\text{m} \\ &= 20,000\text{m}^2\end{aligned}$$

$$\text{Spacing} = 2\text{m} \times 2\text{m}$$

$$\text{Number of seeds per hole} = 3$$

$$\text{Number of stands along the length side} = 200/2 = 100 \text{ stands}$$

$$\text{Number of stands along the breath side} = 100/2 = 50 \text{ stands}$$

$$\text{Total number of stands} = 100 \times 50 = 5,000 \text{ stands}$$

$$\text{Number of seeds per hole} = 3$$

$$\text{Thus the seed rate} = 5,000 \times 3$$

$$= 15,000 \text{ seeds}$$

Planting:- This is the placement of seeds into the soil for germination. Different crops have different planting methods as such different planting methods (dibbling, drilling and broadcasting) are employed in crop production and the method to be adopted depends on crop and resources available. Time and method of planting as well as sowing depth are very crucial in crop production as each of these influence seed germination, seedling establishment, crop growth and yield [8]. For good germination, sesame requires shallow planting depth due to the smaller nature of the seeds. Reference [9] also reported that, early sown garlic plants tend to grow more vegetatively and produce high yield compared to lately planted garlic plants.

Post Planting Operations

These are operations carried out after planting which include the following:-

Weeding:- This is the removal of unwanted plants found growing among the cultivated crops. Weeds compete with crops for limited environmental resources and harbor pests and diseases that are harmful to crops [4]. Such competition usually becomes manifested in reduced crop growth and yield. Timely weeding is very necessary if crop yield is to be increased.

Thinning:- This is the removal of weak or extra seedlings from a stand when the seeds per stand germinate more than required. Thinning is preferably done after rain when the soil is wet and care must be taken not to damage the roots of other plants.

Supplying:- This is the practice of replanting the vacant positions created by poor seed germination. It is done when all the seeds have germinated.

Fertilizer Application:- Cropping depletes plant nutrients from the soil and fertilizers are added to the soil to supplement or replenish the lost nutrients. By following fertilizer recommendations in terms of method, dosage, time and number of application, farmers may get back, more than double of their investment [10].

Mulching:- This is the placement of materials such as dry grasses, saw dust, leaves, wood shavings etc over the soil surface. Mulching conserve soil moisture, regulates soil temperature, provides erosion control, suppresses weed growth, serves as vegetative cover, improves soil condition and increases soil fertility.

Control of Pests and Diseases:- When crops are attacked by pests and diseases, the result is low yield or sometimes total crop failure. It is therefore necessary to control pests and diseases. This can be achieved through the use of resistant varieties, good farm management practices, crop rotation, use of natural enemies of the pests and spraying with insecticides.

Harvesting:- When crops are fully matured, the useful parts are removed or detached from the parent plants for consumption or for sale. This practice is called harvesting. Timely harvesting is very important in crop production as delay in harvesting leads to reduction in crop yield and quality.

Processing:- This is the process of transforming the farm produce into consumable form or into forms acceptable to the consumers. Wheat, for example, requires drying, threshing, winnowing and grinding to make bread. Well processed goods fetched more income to the farmer.

Storage:- This involves the safe keeping of farm produce that will not be sent to market or consumed immediately. The storage facilities should be dry and free from insect pests and diseases. Good storage fetches more money to the farmer as most of stored goods are sold during off-season when price is relatively high.

Marketing:- This is the last stage of farm operations in which the farm produce to be sold are sent to the market. Marketing is very important in agriculture as it ensures the movement of goods and services from where they are produced to where they are not produced. Effective marketing strategy yields more profit to the farmer.

4. Conclusion

It could be concluded that, good crop management is one of the pre-requisites for successful crop production. Based on this, farmers should be encouraged and motivated, using all the available avenues, to not only adopt but also practice modern farming techniques and inputs for increased productivity and profitability.

5. Recommendation

- i. Government should recruit more extension staff, as the current number of extension officers is grossly inadequate to cover the large number of farmers within the state.
- ii. Intensification of agricultural extension services within the state as it is the only means through which farmers could be encouraged to adopt and practice modern farming techniques and inputs for increased agricultural production,
- iii. Research Institutes should double its efforts in the area of seed production and multiplication programme so that, seeds of superior quality will be made available to farmers.

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