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ENVIRONMENTAL PROBLEMS OF LYCOPERSICON *ESCULENTUM* PRODUCTION IN IRRIGABLE AREAS OF FUNTUA, KATSINA STATE NIGERIA

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ABSTRACT

Agro-food industries developments are the main agendas of Africa's move to encourage food production in her states. Because rains are sporadic in these tropical regions of Africa, foods are produced even under irrigation scheme, in order to meet up for the gap. Southern Katsina state has a potential land for irrigation which is also highly fertile. For years, garden vegetables such as tomatoes, onions and peppers are produced and marketed in large quantities. Nigeria is perhaps the best producer of tomatoes throughout the tropical regions. This paper examines the environmental problems that constraints its production, alongside with the highlights of manageable ways to improve its way of production.

Keywords: Southern Katsina state, Irrigation, Tomatoes

INTRODUCTION

The area of study selected (longitude 7^0E and 9^0E and latitude $11^0$30'N and 13^0 15'N) is the one where a medium sized stream passes through, at the heart of Funtua town, from Rijiyar `Yan wanki, where the stream took its source, passing through the edge of Dutsen Tanki stretches to Belen Gada village to Mairuwa. At around the foot of the rock about 13 gardens are cultivated, using the brackish (half stagnated) water of the stream valley. Although not too deep and wide, the stream can be utilized to keep water in it throughout the dry season. Why? Because all the water from the tank placed on the hill discharge itself in the stream. More so, all the used and waste waters of environ is also discharged in the stream. So people around use that advantage to construct bridges to halt the movement of the water to utilize it for irrigation. It will survive there up to next rainy season (EEC/FGN, 1992).

This makes irrigation of tomatoes a success (SEAP, 1998). Tomato is a vegetable crop cultivated by small farmers in the area on small plots and sometimes interplanted with other crops such as beans, okra, spinach and sweet potato. It requires soil that is rich in organic matter and rainfall between 1016mm to 1143mm per annum. Constant supply of water should be made, either by the irrigation or watering, if in the dry season. It can be grown all year round provided water is available. The seeds of the tomatoes are raised in nurseries before transplanting to the main field. Nursery beds (seed boxes) are prepared near the water (H_2O) source and the seeds planted 5cm apart on the beds .Seed boxes are filled with top soils. Adequate water supply is necessary at the early stage. Shades are provided for the young seedlings and it is easier using seed box as such they can be moved to shady places (Werran, 1998).

In the study area time of planting varies but usually between September to October (SEAP, 1998) After 3 weeks in the nurseries the seeds are transplanted to the field at a spacing of about 60cm by 60cm.The seedlings are placed at the rate of 1 per hole.

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AIM AND OBJECTIVES

This study is aimed at identifying the environmental problems associated to tomato cultivation in the areas around river Gadan-Bele in Funtua,Katsina state with a view to estimating, implications and gains, marketing procedure, constrains regarding cultivation and make recommendations to reverse the problems caused by environmental factors or otherwise.

MATERIALS AND METHODS

Reconnaissance Survey

Reconnaissance survey was carried out to familiarize the researchers with the area as well as be able to select respondent farmers for the study. This was done before the administration of structured questionnaire

Questionnaire Administration

An eight, (8) items unstructured interview questionnaire was prepared tested and administered to a total of 50 gardeners who cultivate tomatoes.

Field Observations/Measurements

Observations relating to the crop in terms of cropping pattern, monitoring and other agricultural practices done keep the crop in good condition were made. Other issues relating to diseases and pests, marketability, stress, influence by topography and other environmental effects were observed, asked or measured and the results are presented.

RESULTS AND DISCUSSIONS

After 100 days of transplanting the fruits will start too ripe. They are then hand-picked immediately. Tomato is highly perishable. Harvesting is spread over a number of weeks. But it can store longer if processed into canned paste. Only canned paste can be exported (Kankara, 2002).

It is an increasingly important crop in the area and it seems a great experimentation and research has been done in selecting suitable cultivators in the area and exploring the most efficient methods of growing the crop for local consumption and processing. In the study area, other crops are cultivated alongside with the tomatoes. When ripped, tomatoes can be eaten raw, used for soup and for vegetable salads preparation, and other foods. From its planting to harvesting its 100 days

Upon all the crops that can be cultivated tomato production is the cheapest and most profitable crop, provided there are favorable markets (Ladan, 2004).

Environmental Constraints

Diseases and Pests

The climate is favorable for the breeding of pests and micro living organisms that carry the diseases

a. *Fusarium*: Wilt-This is fungus diseases caused by *fusarium oxysporium*. The spores are borne in the air while the mycelium is borne in soil. It affects the leaves, causing gradual defoliation by wilting and drying up of the whole plant.
b. b.) *Leaf spot:* Also a fungus disease caused by *cladosporium spp*.The spores is carried in the air. Circular white patches of the hyphae and the spores are found at the under surface of the leaves which later develops to form necrotic sports.

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c. *Mosaic Disease:* This is a virus disease transmitted by insects while sucking the plant. It causes mottling of leaves; it bleaches leaf veins resulting in stunted growth and general reduction in plants vigor(Ladan,2007)

d. *Root Knot:* A disease by a Nematode called Root Knot because the Nematode bores into the root of the plant causing usual enlargement of knotting of certain cells of the roots, resulting in retarded growth and wilting of infected plants.

Overheating/Sunshin

Those tomatoes cultivated during rainy season or before December as investigations revealed are not affected by intensive isolation because of high humidity and dry, cold climatic condition. Those planted during the intense insulation period when earth surface receives the maximum amount of radiation, do not grow well, it will not ripe. The cold humid or wet condition influence its rapid growth and ripening. High temperature results in poor yield due to pollen becoming sterile. If 20 baskets can be obtained in a ridge with intensive insulation, only 7 can be realized. If 30 only 10 can be realized (Olofin, 2000).

Insufficient Moisture

Because precipitation in this tropical corner of the area is very uncertain, sometimes water shortages can affect its production (Tulu, 2002).

As discussed earlier, the irrigation uses most of tap waters from *Dutsen-Tanki* for crop rising. Although, irrigation water in the stream valley do not dry up completely sometimes.

Topographic Nature

Those cultivated in *Fadamas* are killed by the very first rains of the hydrological season of the year. While those done on plains are not affected due to nature of the topography (Ladan, 2004). Flooding or over flowage is also aided by the nature of the topography.

Over flowage of Bank/Flood

For almost all seasons, over flowage of the bank during intense heavy rain clear away the fence and the crops planted. In September 2008 alone over flowage of the bank washed away everything in the garden, causing loss of crops and the fences worth N150,000 in one single garden (of approximately one acre).Over N200,000 was expected as gain if that flooding could have not affected the garden (Ramlingham,2001).

Grazing Animals

More than 90% of domestic animals raised in the area are under traditional system of animal husbandry, where the animals are left to roam about in farms, streets, to search for food on their own. Under such a condition, animals especially goats patronize the gardens around *Dutsen Tanki* to eat up the leaves before it ripe. Goats jump long fences made up of dry cone sticks and long broad sticks to enter into a garden. But sometimes if hot peppers are planted without tomatoes the goats avoid such places (Kankara, 2007). They only eat the leaves, abandoning the seeds. Hot peppers do not yield leaves as tomatoes do. Overgrazing enhances deforestation (Cunningham, 2003).

Periodicity or Seasonal Regime

The ones harvested before November are marketed with gain. After November, they flood markets, because it is that time every farmer harvested his crops. As a result their market prices fall. Where a basket can cost N1, 000, failure in markets can make the price to trickle down to N100 or even less. Also the one done before December is never affected by excessive rain, if it exceeds maximum that is for those planted not on ridges (Tham, 1992).

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Market Nature

International markets where garden crops are sold at profitable prices are absent or at far distances from Funtua region (RUWASSA, 2007).

CONCLUSION

It has been demonstrated that tomato and pepper cultivation especially under dry season in South Katsina State, play pioneer role in the promotion of export crop production ,over a long period of time. This paper does not have an overview of the environmental factors on tomatoes and pepper production; rather it examined the quantity, areas of production and marketing channels of processes of such crops. It was also found that peasant farmers are unaware of government's initiatives, it is therefore recommended for the government to ginger northern farmers and encourage them to take loans and to reduce interest rates. Marketing channels such as Lagos, Abuja and Kaduna are not enough. Markets should be expanded even beyond Nigeria, to raise more crops. Surely irrigable regions of south Katsina State are potential arable areas to feed the whole African region.

RECOMMENDATIONS

Based on the findings above the following recommendations are suggested:

1. Farmers should be organised into cooperatives groups
2. Farmers should be encouraged to take loans to established small scale industries where crops can be processed.
3. Farmers should encouraged to abandon simple tools and traditional methods of irrigation and embrace more advanced methods like the use of pumping machine or sprinkler method
4. Other assistances from foreign organisations can be sought by the governments to assist individual farmers.

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