

land than to plant a sole crop (mono- cropping). One of the executive principles of ERGP which is to “achieve agriculture and food security” led to a project in which 250,000 Farmers under CBN Anchors Borrowers’ program had access to N55bn which further drove the nations target of attaining self-sufficiency by 2018 with respect to food crop production.

Nigeria’s leading role in cassava production is fuelled by research efforts of the International Institute of Tropical Agriculture (IITA) and National Root Crop Research Institute (NRCRI) as well as Federal Government of Nigeria Cassava Transformation Agenda (CTA) in breeding, release and multiplication of improved cultivars to farmers. Cassava being one of the most consumed root crops in the world and second important staple food for energy in sub-Saharan Africa providing up to 285 calories per person/day (Benesi *et al.*, 2004) and as at 2012, Nigeria was the leading producer, ahead of Brazil with estimated annual production of 54 and 24 million tonnes respectively (UNCTAD, 2012; FAO, 2013).

In addition, Researchers are working non-stop on advanced cropping system, laboratory work and several field trials and extension programs to enlighten farmers are running in virtually every geo political zone of the nation hence the awareness of the advanced cropping system is on a viral spread.

A major technique of inter-cropping is the Cereal – Legumes intercropping method, this technique is generally acceptable and quite sustainable due to the fact that legumes help fix atmospheric nitrogen as a result of the actions of Nitrosomonas and Nitrobacter (nitrifying bacteria) found at the root nodules of legumes. Legumes also help in suppressing weed growths due to their growth behavior and they also store water. Cereals such as maize plant serves as canopy for the creepy legumes so as to check scorching which could occur as a result of direct sunlight, it also allows adequate sunlight to pass through for photosynthesis. In addition, legume crops are a potential source of plant nutrient that supplement inorganic fertilizer.

As part of the mandate of Bioresources Development Centre (BIODEC), Ilorin's responsibility to Research, Develop and commercialize its result in any area of bioresourcing with agriculture being a paramount focus. Intercropping in BIODEC Ilorin was birthed as the principal means of intensifying crop production both spatially and temporally to improve crop yields for farmers.

In light of the aforementioned responsibility, the Plant Bioresources Unit of the Centre cultivated 3 acres of land with the following crops:

- ❖ Cassava (*Manihot spp*)
- ❖ Maize (*Zea mays*)
- ❖ Cowpea (*Vigna unguiculata*)
- ❖ Okra (*Abelmoschus esculentus*)
- ❖ Yam (*Discorea spp*)
- ❖ Sorghum (*Sorghum vulgare*)
- ❖ Sweet potato (*Ipomea batatas*).

Choice of the crops listed above was made after considering the following:

- The soil type (visual appraisal)
- Available resources
- Drought resistivity
- Climate.

The factors listed directly influenced the growth pattern and yield of the crops after harvest.

Review

Bioresources Development Centre Ogbomoso (a sister centre) has successfully developed a cassava plantation and their produce is used as raw material for bio-ethanol production. The International Institute of Tropical Agriculture (IITA) also has cassava, maize and yam as part of their mandate crops, which generate a large amount of internal revenue from the commercialization of the produce of these crops every year. Shongai Farms at Patigi, Kwara state also supplies a particular village along Oyo-Ogbomosho road cassava for mass production of cassava flakes (Garri).

Each crop listed in the introductory part of this review can be termed “hot cake”, by 2020, one of the outlooks for the ERGP (Agricultural transformation and food security) enshrined that Nigeria would become a net exporter of key agricultural products and cassava is part of these products.

One bottle neck experience in crop cultivation is when non-viable planting material is used. It usually results in great lose; therefore we checked the potential loss by getting our planting materials from reliable sources. (Sources: IITA, PREMIER SEEDS, BIODEC OGBOMOSO and KWASU PRIVATE FARM).

Farmland preparation was carried out by local laborers; we opted for nearby laborers to empower them, to carry them along because we want them to get requisite knowledge from our technique (most of them own a farm, although subsistent) and also to achieve one of the broad objectives of the ERGP which is “investing in people” (job creation and youth empowerment).

The planting technique applied was well sorted out for due to our crop species and the soil fertility which was also taken into consideration. The arrangement is as follows:

- Cassava + Maize on a heap
- Maize + Cowpea on ridge
- Maize and Yam on a heap
- Maize and Okra mixed cropped on a portion of the farmland.
- Sorghum + Okra on ridge.
- Cowpea and Sweet Potatoes in between heaps of Cassava.

The intercropping arrangement listed above has given great yield for some of the crops harvested.

CASSAVA

The cassava species planted can be sorted into the TME 419 spp and the INDIGENOUS VARIETIES. Great differences were discovered between the species, TME 419 being the best in plant height and weight of the root tuber. This great difference was also recorded by farmers within the catchments of the Cassava Adding Value for Africa (CAVA) in ogun and ondo states of Nigeria. The farmers hailed TME 419 variety promoted by the project as an alternative to local low yielding cassava varieties. The first farmer to harvest from the TME 419 cassava stems planted in 2009 late season, Alhaji Abdulrahman kolawole Otun of Otun farm Asooro Village, Ewekoro local government area said “The cassava tuber was uprooted and the weight doubled that of the traditional cassava such as the *idi leru* i.e root heavy spp”. He further mentioned that after the sales, the profit he realized doubled that of the traditional variety. At kolawole otun’s farm, TME 419 yielded 44.4 Tonnes per hectare against the local “sanmi” which was 27.6 Tonnes per hectare.

Below is a series of bar charts indicating the differences between the TME 419 and the indigenous variety, data was taken using random sampling technique, in order words there was no factor that influenced our sample choice.

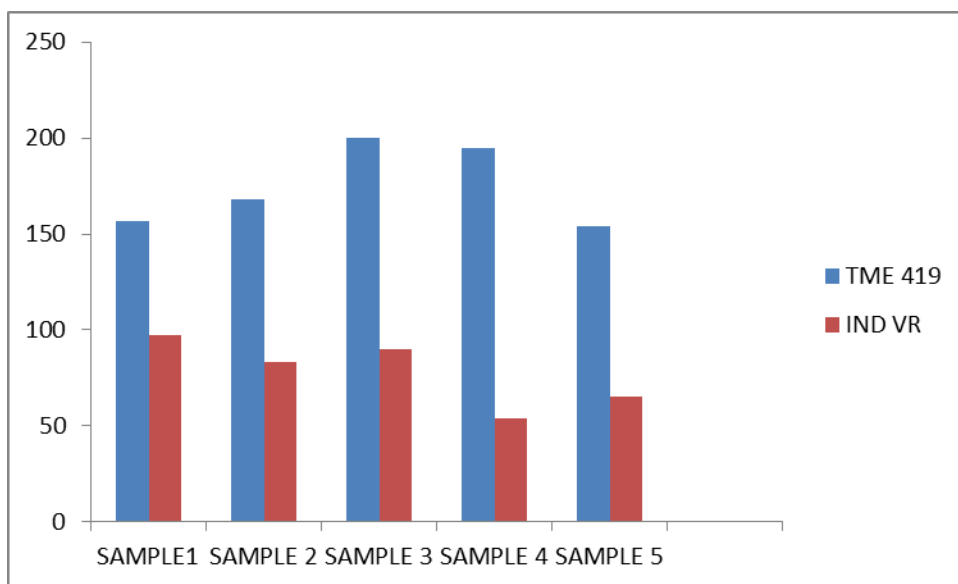


Fig 1: A bar chart showing the differences between TME 419 and Indigenous variety in terms of plant height (cm).

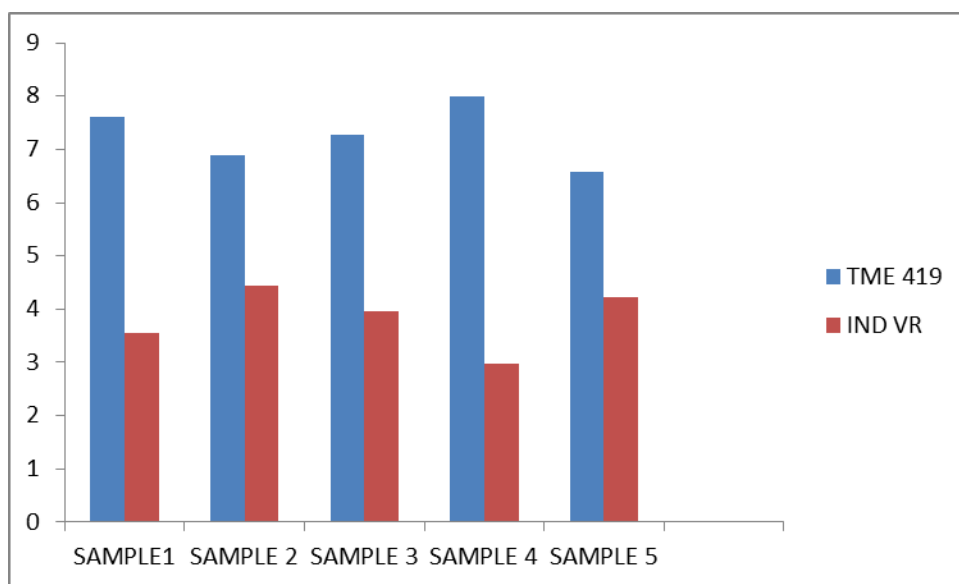


Fig 2: A bar chart showing the differences between TME 419 and Indigenous variety in terms of weight of root tuber (kg).

From the charts above, we can conclude that the TME 419 is a better variety in comparison to the indigenous variety even though the indigenous farmers in our vicinity claimed that their indigenous variety would surpass TME 419 in root tuber formation in terms of length and size.

OKRA

The specie of okra planted was fruiting every four (4) days; its height is about 20cm above ground level and at least two (2) fruits per plant per harvest.

MAIZE

The 3rd most consumed cereal in the world gave a great yield, we got seeds from IITA and PREMIER SEEDS, the former resulted in an average height maize plant, tasseled early enough and fruited well, although the pericarp of the seeds are quite hard. The latter grew a bit taller than the former, fruited well also and it has a succulent pericarp.

COWPEA

This crop gave us some challenges due to it being susceptible to insect infestation and ruminant attack; measures were taken to get rid of the pests in time so as not to experience zero yields.

Sweet potato, Yam and sorghum are not at harvest stage yet, although we can draw a few inferences from the growth pattern. Sweet potato is spreading rapidly hereby getting rid of pest, no sign of any infection or infestation. The sorghum is thriving well also, growing taller and very green. The yam on the other hand has been experiencing stunted growth which is has a result of the soil structure of the particular portion where the yam was planted, the soil is highly water logged.

MARKET AND MARKETING

The market is very important for profitable agriculture; every farmer's goal is to cash back after spending much during farm operations, also with respect to the Research for Development (R4D) initiative, every MDGs is

expected to cash back from their various economical operations. The ERGP recognizes the power of markets to drive optimal behavior among market participants. The Plan prioritizes the use of the market as a means of resource allocation, where appropriate. However, the Plan also recognizes the need to strengthen regulatory oversight to minimize market abuse. Hence the harvested crops were sold on the farm and at the local market. Due to the on-season planting, the harvested produce flooded the market from several farmers which led to a rapid decline in price hereby reducing the profit margin.

CONCLUSION

The planting technique applied gave optimum yield and the following conclusions were made:

- Water logged soil should not be used for yam cultivation,
- Measures should be taken early enough to check insect and ruminant attack in a farm where leguminous crop is planted,
- The planting technique applied in this review is excellent as no loss was recovered due to the technique,
- Hard pericarp maize should be allowed to dry up before harvest because that is when it will be marketable, hard pericarp maize has higher starch content compared to the soft ones hereby its usage for Pap (*ogi*) and other native meals is reasonable.
- Off season - irrigation farming is also recommended for massive profit.

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