

UNDERSTANDING PLANTS: A KEY TO IMPROVED CROP YIELD

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ABSTRACT

Plant physiology is the study of functions and processes in plants. This is useful in understanding the dynamics of yield of crop plants. This lecture that presents results of my research work for about three decade attempted to analyse how the complete understanding of plants can make meaningful improvement in crop yield, without depleting natural resources or destabilizing the environment.

The knowledge of flower, fruit production and development in plants identifies areas of flower and fruit wastage and it serves as a prelude to sustainable yield improvement. Cultural aspects of cultivation which include appropriate sowing dates and weed control methods were established for some legumes and rice. It is suggested that continued legume rotation over a period of time coupled with soil amendments could increase soil fertility to reduce *Striga* incidence. The lecture discussed the influence of environmental factors: temperature, light, soil and climate change on crop yield. Temperatures of 22-32°C favour cassava yield while reduced light intensity is detrimental to soyabean yield. It was suggested that soyabean should not be cultivated with taller intercrop that have a longer growth cycle. Mexican sunflower at 40t/ha will reduce heavy metal accumulation in maize crops grown on Pb contaminated soil. Possible ways of alleviating climate change in cocoyam production is discussed. Adequate fertilizer (inorganic and organic) rates were reported for some legumes, cereals, and vegetables in Nigeria and for a *Eruca sativa* in South America. Seed storage has been identified as the easiest way to conserve yam genetic resources in a long term basis. We found that yam seeds storage physiology follows an orthodox pattern, except that seeds have a longer storage life at 14.5% seed moisture content than 10% seed moisture content when stored at 15°C. Seed storage offers a practical approach to long term conservation of white yam germplasm. Proper storage of propagules is necessary for maintaining highly viable seeds.

A highly collaborative research is recommended especially in relation to crop yield and farmers' adoption of methods that will improve yield. Research on crop yield should include not only crop physiologists but also Ecologists, breeders, soil scientists, biochemists, agricultural extensionists, agricultural economists, geographers, and sociologist as no single expert has the complete answer to crop yield improvement.