

HOW TO MANAGE SOIL FERTILITY

Adaptable ideas

By Prossy Nandudu

The National Planning Authority (NPA) in consultation with the Government and other stakeholders developed Vision 2040 in 2013.

One of the areas that will help Uganda achieve this vision is the agriculture sector.

Agriculture is the backbone of Uganda's economy. According to a 2010 report from the Uganda National Bureau of Statistics, it employs 65.6% of Uganda's labour force and contributes 21% to the GDP.

According to NPA, agricultural production is dominated by smallholder farmers growing food and cash crops, trees, fruits and flowers and livestock keeping, among others.

Uganda is one of the leading producers of coffee and



Zaake inspecting a coffee garden to check for the fertility of the soil

bananas in the world. It is also a major producer of tea, cotton, tobacco, cereals and grains in the region.

EXPORTS

According to Uganda Export Promotions Board (UEPB), by 1994, Uganda was earning up to \$460m from exports. Uganda's overall merchandise exports increased more than four-fold from \$450.1m in

Reducing soil fertility is considered the biggest constraint to growth in productivity.

2001 to about \$3b in 2015.

It increased from \$2.687b in FY 2015/16 to \$3.16b. The exports that showed a positive trend, from 2015/16 to 2016/17, according to Bank of Uganda, are coffee, gold, cotton, fish, fruits, vegetables and cotton.

However, productivity of most of these crops has been reducing over time. According to UEPB, the reasons range from high cost of inputs, poor production methods, limited extension services, over dependence on rain-fed agriculture, limited markets, land tenure challenges and reducing soil fertility. Of all these, reducing soil fertility is considered by many scholars and researchers as the most constraining factor to agriculture.

UGANDA'S SOIL

According to Prof. Julius Kitungulu Zaake, a soil scientist, most soils in Uganda are less productive than they should be.

Zaake explains that fertile volcanic soils in mountainous areas are not as productive as they should be due to rapid population growth and the resultant pressure on land for both cultivation and settlement. This has been exacerbated by floods which wash away the top soils.

DETERMINANTS OF SOIL

According to Zaake, soil is made up of 15 to 16 different

Uganda's exports over the last two years

EXPORTS/ FY (\$MILLION)	2015/16	2016/17	INCREASE
Total Exports	2,687	3,16	475.99
Coffee	352	490	138
Gold	204	339	134
Sugar	61	117	55
Industrial products	250.91	304.6	53.7
Cotton	24	48	24
Fish & its products	115	131	15
Others not mentioned above			99.3

nutrients. For plants to grow as expected, the soils must have all nutrients.

The soil also needs chemical nutrients like nitrogen, phosphorus and potassium (NPK).

Magnesium, calcium and sulphur, are also required in small quantities while iron, copper, boron, manganese, zinc, chlorine and sodium are required in minute amounts.

Zaake says there is a misconception among farmers that NPK is a single fertiliser or nutrient for the soil. He says NPK is a combination of three nutrients needed by plants for the different stages of growth.

"When planting, the first interest is root formation, so farmers should apply phosphorus. When leaves start to show, nitrogen should be applied and when it starts fruiting, potassium can be added to make a complete set of NPK," Zaake said.

HOW SOIL LOSES FERTILITY

Organic matter which is always on top of the soil, is washed away through soil erosion and bush burning, leading to loss of nutrients like nitrogen and sulphur. This leaves the soil bare.

According to Zaake, continuous tillage affects the larger spaces of air which tend to disappear, especially for the clay soils. Removing all the weeds and placing them on the boundary exposes the soil to direct heat and rains. Unfortunately, after harvesting a crop, most farmers do not fertilise soil to replace lost nutrients.

Zaake adds that for comparison, an average farmer in South Africa uses 51kg of NPK per year, while in Kenya uses 23kg per year. In Malawi, Mozambique and Tanzania the figures stand at 16kg, 4kg and 6kg respectively, while in Uganda we use an average of 1.5kg annually.

This, according to Zaake categorises Uganda in negative nutrient balance which is against a 2005 AU resolution in which member

Dealing with loss of fertility

Zaake advises farmers to visit experts from the National Agricultural Research Organisation (NARO) centres and consult extension workers near them for information on how to manage soils.

Soil analysis starts from experts visiting one's farm, where samples from all parts of the garden are taken. To get accurate results, samples should not have any trace of organic manure like cow and chicken dung or any other fertiliser that could compromise them.

During the sampling process, experts look out for the pH which is the acidity or alkalinity of the soil, organic matter NPK, sodium, calcium and the proportion of sand, clay and silt addition to physical properties.

To maintain soil fertility, Zaake says farmers should use both organic and inorganic fertilisers.

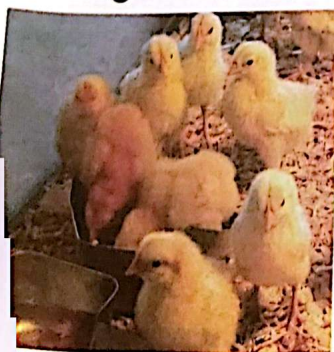
countries were tasked at least 50kg of nitrogen per year.

WHAT TO EXPECT AT THE EXPO

At the expo, Zaake says farmers will get tips on how to maintain soil fertility, use of fertilisers in amounts, choice of a given type of soil access experts who testing and sampling others.

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To learn more

Don't miss the Harvest money expo which is today at the Mandela National Stadium. It will run until February 18. The expo whose theme is "Your farm to the market" is organised by VIG Group with support from various sponsors.