

Economic Botany

- Deals with various uses of plants and plant products for the material well being of mankind.
- It includes practical methods for their improvement.
- Economic uses of plants varies depending on man's primary needs which is ever-increasing
- These needs include those of food, clothing and shelter
- These basic needs are supplied by nature and subsequently improved upon by man especially with the application of Biotechnological methods and science in general
- Many economic plants occur in natural state (i.e. wild and uncultivated) most especially in the forest, while a good number are cultivated for food and industry
- Economic plants may be classified based on their uses along the following lines

Food - cereals
 Legumes/pulses
 Vegetables
 Tubers - stem
 Root

Vegetables - leafy
 Non-leafy

- Oil seeds/oil plants
- Essential oils
- Fruits
- Sugar plants
- Spices and condiments
- Medicinal plants
- Beverages
- Timber plants
- Fibre plants

- Latex/rubber plants
- Paper

Improvement methods

For quality yield especially in crops

- Pure line selection; - breeding
- Improved method of cultivation
- Selection and use of quality seeds
- Use of adequate amount and type of chemical fertilizers, compost, manure etc.
- Selection of crops for a particular locality
- Introduction of high yielding and disease – resistant varieties
- Intensive and extensive cultivation
- Introduction of early maturing crop
- Proper irrigation

SUGAR PLANTS

Cane sugar as sucrose (culture 01) (a combination of glucose and fructose during photosynthesis) is the main commercial sugar, used universally as a secretives. It is one of the best sources of energy available to man. An acre of sugar cane plant, from where cane sugar is sourced, yields more calories of energy than any other field crop covering the same area.

There are two main sources of supply of sugar in the world. These include (1) sugar cane in the tropics (*Saccharum officinarum-poaceae*) and Marple (*Acer saccharum*) mostly in U.S. A.

To a lesser extent sugar is sourced from sugar-beet (*Beta vulgaris – chenopodaceae*). Sugar is also obtained from some sugar palm including the edible date palm (*Phoenix dactylifera*) etc.

Sugarcane: The sugar cane plant is a tall, red-like plant 25-4m in height or more. The plant thrives in Nigeria in wet guinea savannah and rain belt of Nigeria. Large acreage are also planted successfully under irrigation in the dryer Guinea savannah. The Niger

state is one of the largest producer of all the states in Nigeria most especially for commercial purposes.

The plant takes 12-20 months to mature. It is propagated through stem cutting and the root stuck continues to grow as soon as the cutting are planted. Nearly 70% of the national yield of sugarcane is used for the manufacture of white sugar. The remaining percentage goes into the making of unrefined sugar, sugar syrup and for chewing by man known world producers of sugarcane include India, Java, Hawaii and Brazil, Cuba, Egypt. Proper irrigation and the use of fertilizers are important factors in the cultivation of sugar cane. The plant is susceptible to many diseases, particularly 'red rot' caused *Collectotrichum* sp

(1) Juice Extraction

Milling of short lengths to squeeze out juice

Straining to remove bagaste

Boiling of extracted (acidic) juice in boiling house (5.1-5.7 ph)

(2) Clarification

Addition of lime (and phosphoric acid sometimes) to range ph to 7.0

Pumping of juice through high velocity heater precipitation

Removal of impurities in clarifiers

Bright yellow clarified juice + sediment (press mud)

For fertilizer production

(3) Concentration

Clarified juice pumped into multiple effect evaporator

Concentrated into clear pale yellow syrup

Boiling of concentrate in single effect vacuum pan for further concentration in batches to give semi solid massecuite

(4) Crystallization

Not massecuite fed into high speed centrifuge

Separation of massecuite into molasses and sugar crystals (brown sugar) under high centrifugal force

Molasses drained off
and collected

brown sugar
(sugar coated with
film of molasses)

used in
confectioneries

spraying with water under centrifugation to
remove brown coating to have white sugar