

## How to control CBSD

- Always get planting materials from plants showing no CBSD symptoms
- Select planting materials from gardens without history of CBSD
- Plant cassava varieties tolerant to CBSD. In Uganda such varieties are; NASE 3, NASE 14, NASE 15, NASE 16, NASE 17, NASE 18 and NASE 19
- Uproot and replace plants the sprout with CBSD symptoms
- Plant new cassava fields away from old ones
- Seek advice from qualified agricultural officers nearest to you if in doubt

## Producers of cassava stems for seed should:

- Be trained in CBSD symptom recognition and management
- Inspect their fields regularly with the help of trained personnel
- Remove all plants showing CBSD symptoms
- Distribute cassava stems only when inspected, approved by trained inspectors and a movement permit officially obtained from the ministry of Agriculture or National Agricultural Research Organisation (NARO)



CBSD may be spread in stems



Whiteflies, vector of CBSD feeding on cassava leaves

For more information, contact...



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Disease diagnostics  
project  
Facts about Cassava  
brown streak disease

## What is cassava brown streak disease?

Cassava brown streak disease (CBSD) is a devastating disease that causes high yield losses to cassava crop. It causes rotting of the tuberous roots making them unsuitable for food or sale. CBSD is caused by two viruses i.e. *Cassava brown streak virus* (CBSV) and *Ugandan cassava brown streak virus* (UCBSV). A virus is a tiny particle that only survives in a living cell. CBSD now occurs in most countries in eastern and central Africa including Uganda, Kenya, Tanzania and Rwanda. In Uganda, CBSD is highly prevalent in central and eastern regions while low in western and northern districts.

## How does one recognize CBSD?

CBSD symptoms can be observed on leaves, stems and tuberous roots. While some cassava varieties can show symptoms on leaves, stems and roots, others may show symptoms only on either leaves or roots. Symptoms are clearly visible on old cassava plants especially on lower mature leaves. In many varieties young leaves rarely show CBSD symptoms. So whenever the old leaves drop off, the plants may appear healthy when in fact they are infected.

## Appearance of CBSD symptoms on leaves

- Thin yellow lines commonly called chlorosis occurring along and spreading between the small veins of green leaves
- In mature cassava plants, when the older leaves turn yellow or become senescent, the thin yellow lines turn green.
- Leaves showing symptoms of CBSD retain their normal shape and are not distorted or reduced in size.



**CBSD leaf symptoms L):** yellowing on young leaves and **R):** Green pattern on old yellow leaves

## How CBSD symptoms appear on stems

- Dark brown 'streaks' on the stems
- The streaks appear as scratches on stems
- The streaks appear clearly on young green portions of the stems
- In susceptible varieties, the shoot tips may dry and fall off and this may progress and affect the whole plant resulting into 'stem die-back'.
- In severe instances the whole plant may dry and die



Brown streaks on stem

## Symptoms of CBSD on storage roots

- Portions of the edible part of the storage root appear dark brown, dry and hard
- The dry and hard portions consists of dead tissue which is characteristic of the disease
- In some varieties, CBSD causes root constrictions, twisting and size reduction (shrinking) of the storage roots forming string of beads appearance
- The outer skin of the storage roots may develop cracks on the surface



Brown necrotic spots on roots

## Losses due to CBSD

- CBSD causes both qualitative and quantitative loss of cassava storage roots
- These losses can go up to 100% in susceptible varieties
- Roots showing CBSD symptoms are not fit for human and animal consumption and cannot be sold, hence total loss

## How CBSD spreads

- CBSD mainly spreads when cuttings taken from a diseased plant are used to establish new cassava field. The new plants that sprout will have the disease. Sometimes the plants may be carrying viruses without showing symptoms. This occurs in newly infected plants or in tolerant varieties
- CBSD is also spread by small white insects called 'whiteflies'. Whiteflies are usually found on the underside of the upper most cassava leaves. They feed on the sap in cassava leaves, just like mosquitoes feed on human blood. The viruses causing CBSD live in the sap of infected plants. The virus is carried along with the sap into the gut of the whitefly. If the same whitefly later feeds on a healthy plant, it will transmit the virus to the healthy plant hence infecting it