Disease Samples and Reports

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Module 1

Collecting information

1. Types of symptoms
2. Where are symptoms on plants
3. Distribution of sick plants in populations
4. Other: site, agronomic methods

How to prepare a plant disease report: cassava mosaic virus

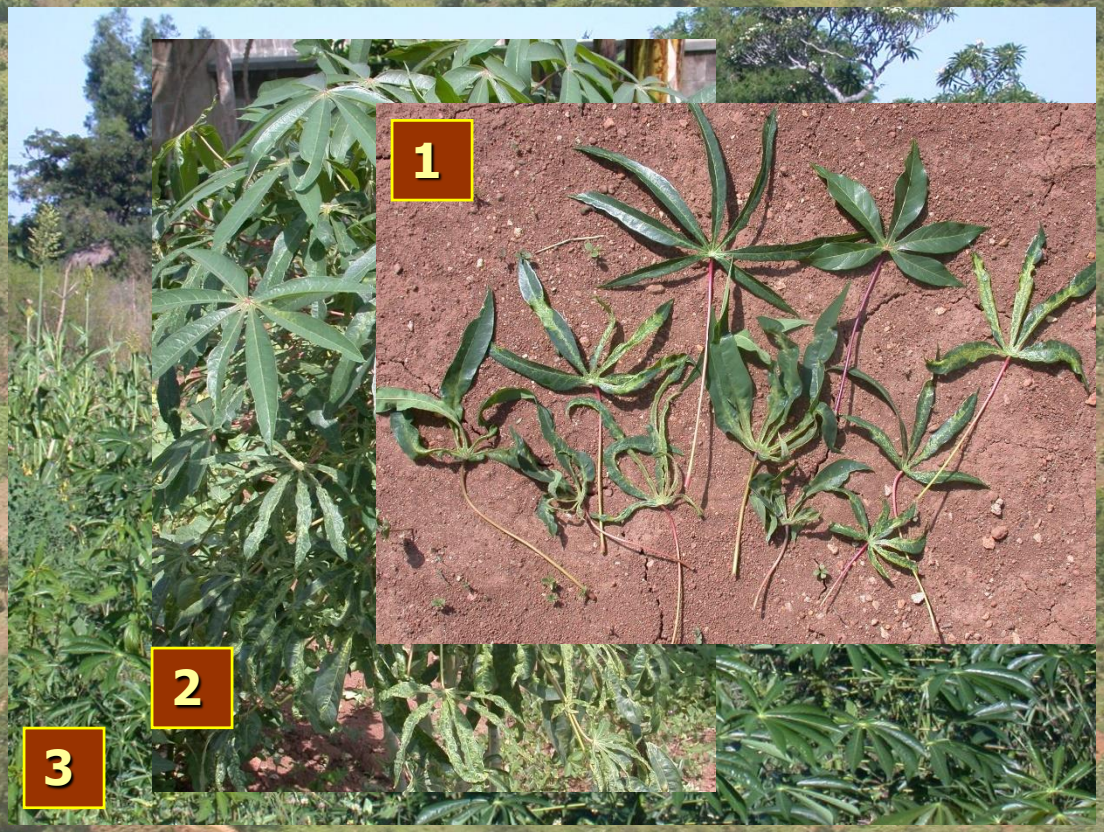
Steps

1 Plant part

2 Whole plant

3 Populations

4 Site details and history



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Step 1

Step 1: get in close

1 Symptoms

What parts are affected

Describe symptoms in short, simple words

Observe changes in: shape, colour, growth

Visible signs of insects, fungi or other pests

leaf - spots

stem – woolly growth

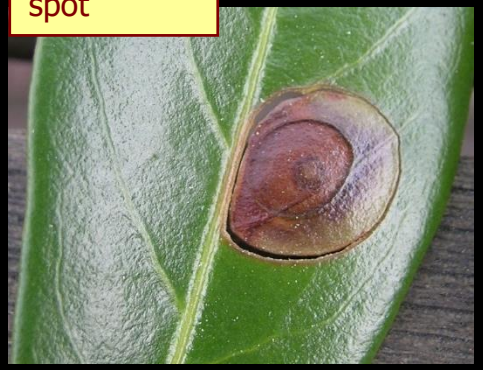
stem – pest present

foliage – unusual shape

Types of foliar symptoms

pustules

spot



drying up

blight

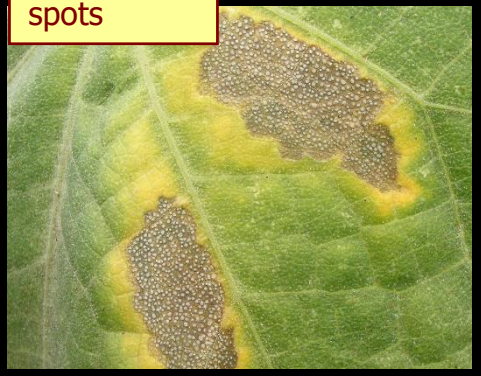
black powder

powdery spots

white marks

mosaic

spots



Symptoms

Symptom	Possible Causes, Sampling Considerations
 leaf spot	Fungal, bacterial, or viral leaf spot pathogen, chemical phytotoxicity. Collect all stages of development. Note pesticide schedule.
 leaf tipburn or scorch	Root or stem dysfunction, water stress, excess soluble salts, herbicide or other chemical injury. Fungal, bacterial or other pathogenic infection. Collect whole plant with roots and soil. Note pesticide and fertilizer schedule plus other components of cultural program.
 distortion	Fungal, bacterial, viral or other pathogenic infection, herbicide or growth regulator injury, insect or mite damage, chemical phytotoxicity, mechanical damage. Collect representative sample of all symptoms. Note cultural program.
 vein enation	Viral infection, growth regulator injury. Collect representative range of symptoms. If possible, keep tissue fresh or submit whole plant to permit observation and testing to take place over a period of time.
 edema	Excess moisture, chemical phytotoxicity, fungal infection. Collect all representative stages. Note soil moisture, preceding weather conditions (prolonged cloudy, humid to wet weather?).
 vein clearing	Viral infection, growth regulator or herbicide injury. Collect all representative stages, note pesticide schedule on or near crop. Keep sample very fresh (essential for many viral diagnostic tests). Whole plant helpful.

Symptoms

mosaic
ringspot

Viral infection, reaction to cold or hot water on foliage, chemical phytotoxicity. Note watering methods, pesticide schedule. Collect very fresh sample or whole plants.

mildew

Fungal infection. Collect symptomatic tissues.

stunt

Fungal, bacterial, viral or other pathogenic infection, nutrient deficiency, water stress, nematode or insect injury, growth regulator damage. Collect whole symptomatic and asymptomatic plant. Note cultural program.

fasciation

Unknown. Usually considered a genetic abnormality, sometimes associated with insect injury. Collect symptomatic tissue of all stages, whole plants if possible. Note pesticide and growth regulator schedule.

proliferation
witches' broom

Fungal, bacterial, viral, or MLO infection. Mite infestation. Micronutrient deficiency, herbicide or growth regulator phytotoxicity. Collect whole plants if possible. Note pesticide schedule.

Symptoms

leaf blister

Fungal infection, insect or mite injury. Collect range of symptomatic tissues.

scab

Fungal or bacterial infection, insect or other injury, chemical damage. Collect range of symptomatic tissues.

defoliation

Root dysfunction, water stress, excess soluble salts, cold, heat, normal senescense, chemical or insect damage. Collect whole plants. Note recent cultural treatments.

chlorosis

Macro- or micronutrient deficiency, low or excess light, growth regulator or herbicide injury, natural pigmentation/variegation, root dysfunction, soil pH problems. Collect representative samples of all symptoms, soil and roots.

wilt

Fungal, bacterial, viral or other pathogenic wilt, root rot or canker pathogen. Water stress, excess soluble salts, high temperature, wind, cold, insect injury. Implies sudden onset. Collect whole plant with roots and soil.

tip dieback

Slower or later expression of same factors as above, plus cold injury, insect damage.

blight

Localized or generalized branch or twig disorder caused by fungi, bacteria, insects, mechanical injury. Collect sample which includes transition zone from diseased to healthy tissue.

Symptoms

girdle

Fungal disease, mechanical constriction, ground-line heat canker, insect injury. Collect symptomatic tissues of all stages of development.

canker diffuse and/or calloused

Fungal or bacterial infection, mechanical injury, heat or cold injury, sunburn, chemical injury. Collect symptomatic tissues, especially transition zones between healthy and symptomatic tissue. Check pattern of symptom expression.

Initiation of root primordia

Excess water, mechanical or chemical injury or pathogenic infection at ground line. Enough vigor to induce root primordia implies sudden onset of disorder to otherwise healthy plant. Collect whole plant or all representative plants parts.

pustule

Fungal infection (rust), excess moisture (exploded lenticels). Collect symptomatic tissue.

gall

Fungal or bacterial infection, mechanical injury, hormonal disruption, insect injury. Collect samples of all stages of gall development, including surrounding soil if below ground.

root rot

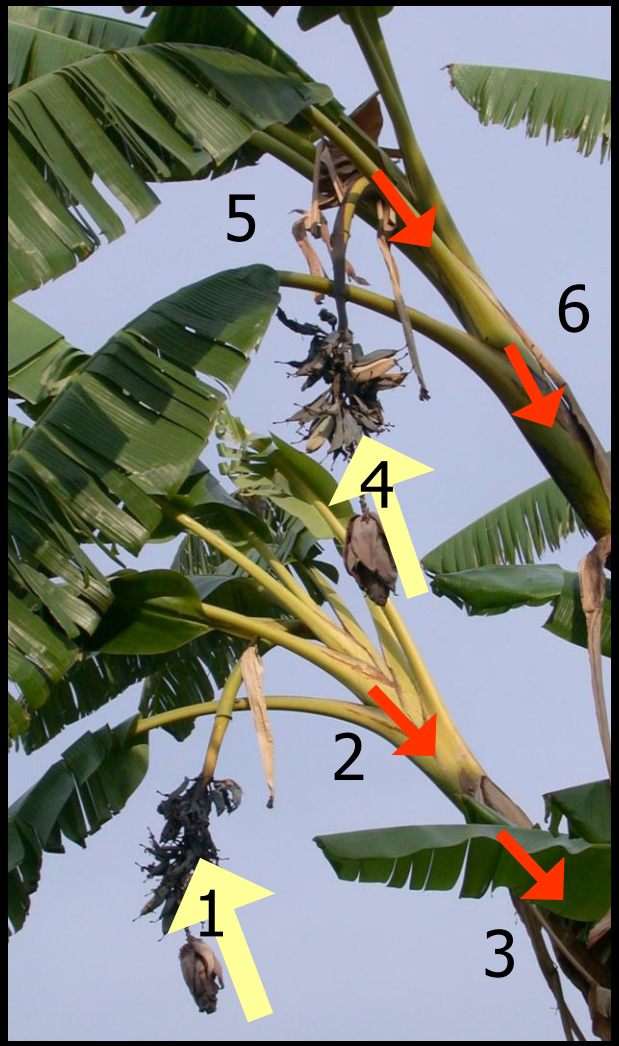
Fungal or bacterial infection, excess moisture, excess soluble salts, chemical injury. Collect whole plant with soil and roots.

nodule root galls

Nodulating N-fixing bacteria, actinomycetes, bluegreen algae, root-knot nematode, insect injury, fungal bacterial or viral pathogenic infection. Collect symptomatic tissue.


Step 2

Step 2: Look at the whole plant



Bacterial wilt enters through the flowers

2 Whole plant

Symptoms are above or below, on one or all sides

Growth stages affected

How symptoms progress

Severity of attack

Fusarium wilt enters through the soil

Distribution of symptoms in the plant

Whole tree

Left side

Whole plant

Older leaves most affected

Only fruits

Sectors of the crown


Step 3

Step 3: Examine groups of plants

3 Populations

Incidence – how many plants are affected

Distribution:
- random
- edge of the plot
- al azar

Remember: plant variety, age, how it is grown

Step 3: look for good viewpoints

Cars, buses, trucks

Buildings, other equipment

Trees

Vantage points for panoramic views


Step 4

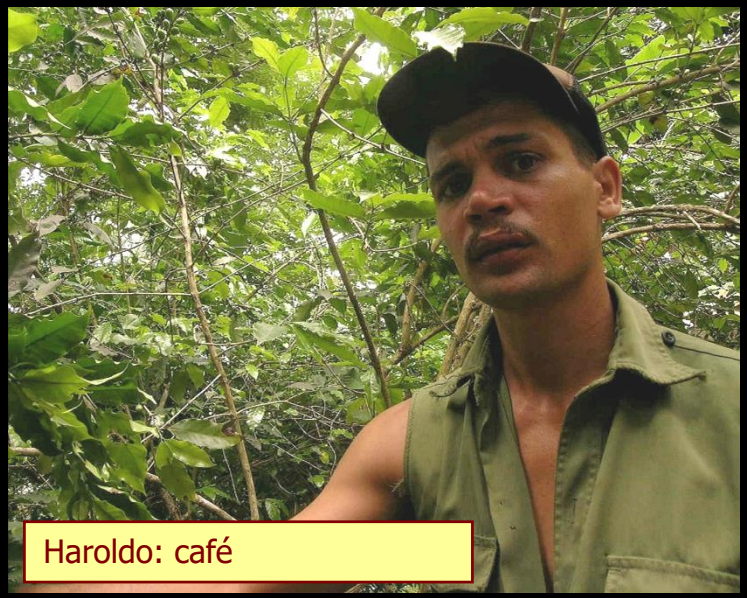
Step 4: Speak to farmers and extension

4 Site details and history

- When did problem appear; is this the first time
- Local name for the problem
- Soil type, climate (patterns)
- Change in varieties used etc.

Fisherman: citrus

Pak Imis: rice



Haroldo: café