

FACT SHEET:

YAQONA (KAVA) DIEBACK DISEASE

MANAGEMENT

A PACKAGE OF PRACTICE

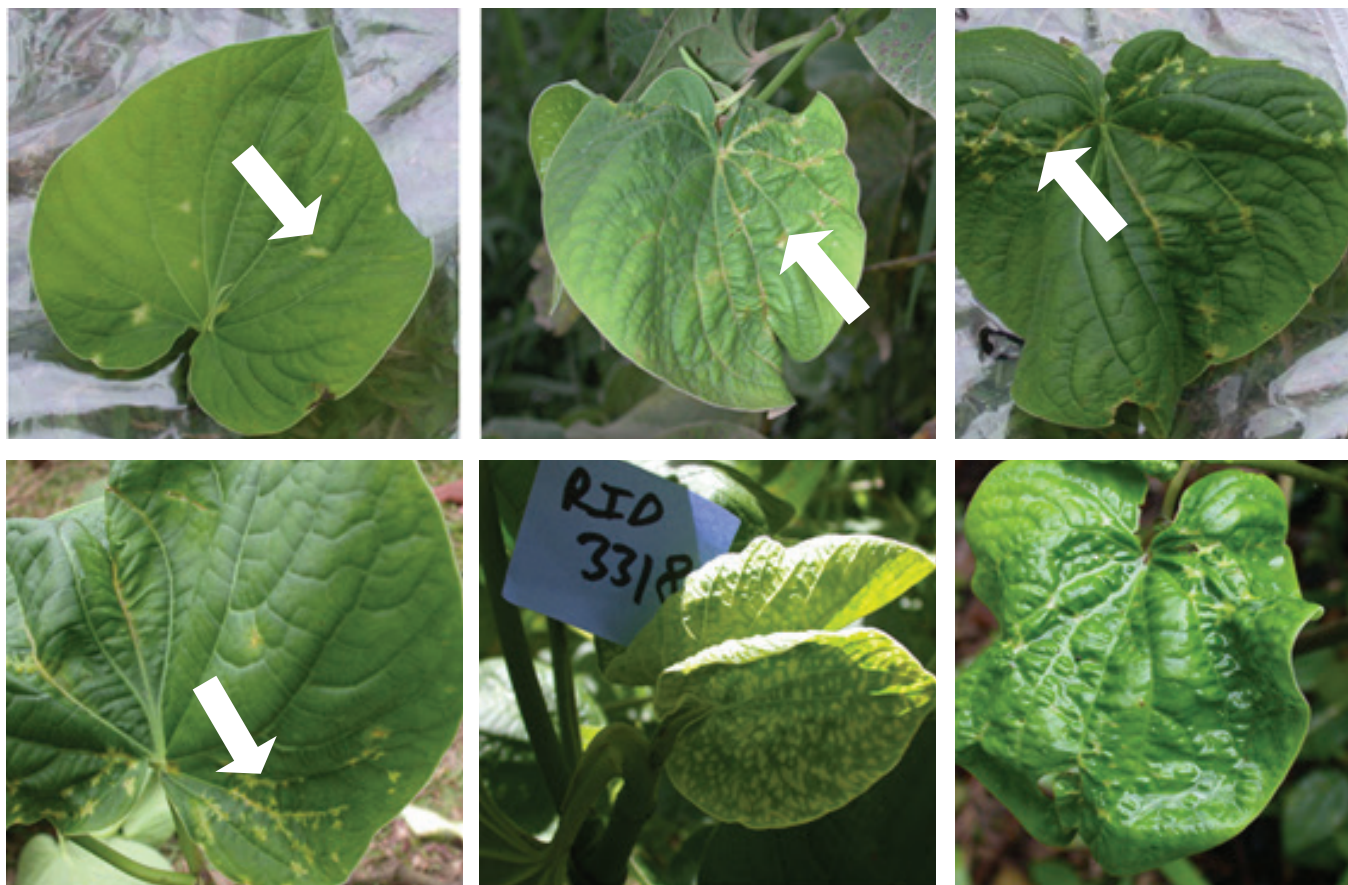
Koronivia Research Station
Plant Protection Unit



This Factsheet contains important information on how to control Yaqona Dieback disease and other Yaqona disease problems. To control the spread of dieback disease, it is important to know how a virus infected plant looks like and to be able to tell the differences between dieback disease from other Yaqona diseases.

What is Yaqona (Kava) Dieback Disease?

- It is a virus disease caused by CMV (Cucumber Mosaic Virus).
- The CMV is spread from plant to plant by aphid insect (*Aphis gossypii*).
- Called 'dieback' because it starts from the leaf and 'melt down' to the stem and even to the root.
- Dieback Disease shows as a fast moving rot that makes the stem go black and quickly "melt down" and die.
- CMV can only cause the disease when one or more different environmental conditions interacts with the Yaqona plant during its growing stages.
- Degree of dieback disease infection varies in different locations.
- Major problem affecting yaqona production.
- Primary infection starts from infected planting material or presence of aphids.
- Present in Fiji, Tonga, Samoa, Vanuatu, Hawaii and Cook Is.



Dieback (CMV) Symptoms on Leaves (Fig.1)



Dieback (CMV) Symptoms on Stems (Fig.2)

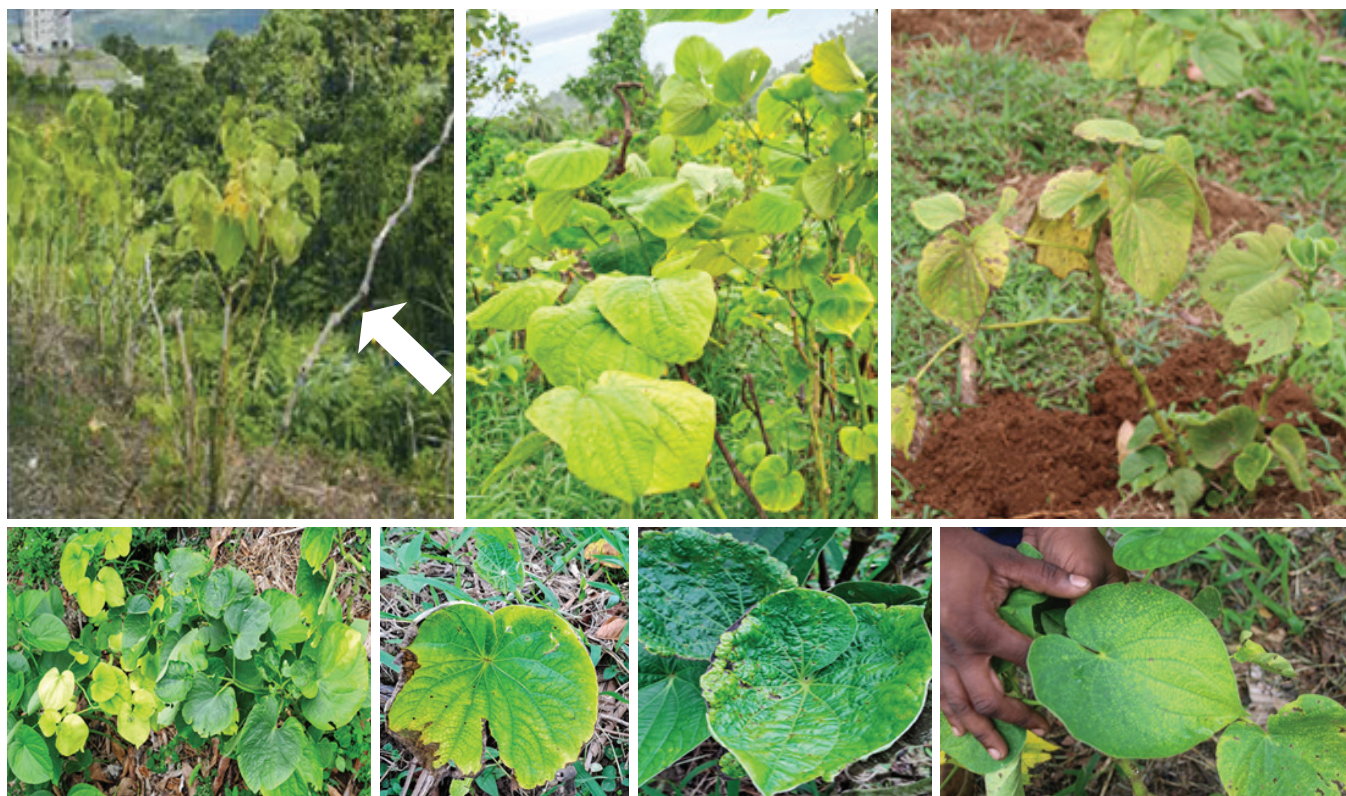




Dieback (CMV) Symptoms on Roots (Fig.3)



Symptoms Caused By Other Factors (Not CMV) (Fig.4)



CMV Symptoms on Other Plants (Lettuce, tomato, bean, cucumber and commelina weed (Fig.5)

SYMPTOMS ON OTHER PLANTS



CMV Host & Non-Host Plants

Host Plants - Not to be planted or present with yaqona	Non-Host Plants – Can be planted with yaqona
1. Cucurbits - watermelon, cucumber, pumpkin	1. Aroids - Taro, Dalo ni tana, and Via
2. Solanaceous Plants - tomato, tobacco, capsicum, chilli and eggplant	2. Banana
3. Passion fruit	3. Coconut
4. Pineapple	4. Citrus
5. Leguminous plants - peanuts and beans	5. Cassava
6. Legume tree – Coral tree (drala)	6. Pawpaw
7. Weeds - mile-a-minute and commelina	7. Sugarcane
	8. Yams
	9. Sweet Potato

WHAT CAN WE DO?

- A. There is no control to remove the virus.
- B. Chemical control is not appropriate for this disease. There are no chemicals that can rid plants of virus, and although many insecticides kill aphids, but the timely application of these insecticides is important before they feed and spread the virus.
- C. Only a combination of management practice will work- Integrated Pest Management (IPM)

STEPS TO YAQONA DIEBACK DISEASE MANAGEMENT

STEP 1: CHOOSE A GOOD PLACE TO GROW KAVA

Grow traditionally: less virus infection will occur on small and isolated plots planted underneath trees.

This is because tiny insects called aphids which are carriers and also assist in the spread of the virus from place to place, cannot do this well when kava plants are separated by “buffer zone” of plants that cannot be infected. Such plants are known as non – host, which includes more trees and much of the natural vegetation.

Use only well drained and fertile soils as these are needed for fast and strong growing plants. Healthy plants can prevent the invasion of virus into yaqona plantation. Kava should not be grown in the same place continuously as this will build up the nematode population.



Figure 6: Grow under shade

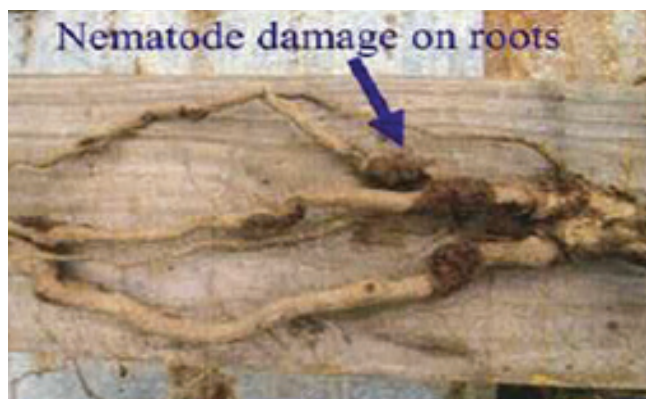


Figure 7: Shows the nematodes damage on roots

STEP 2: START WITH HEALTHY PLANTS

Stems used for plants must only come from plants not showing any signs of dieback. It is best to use plants growing in places where there is no active dieback.

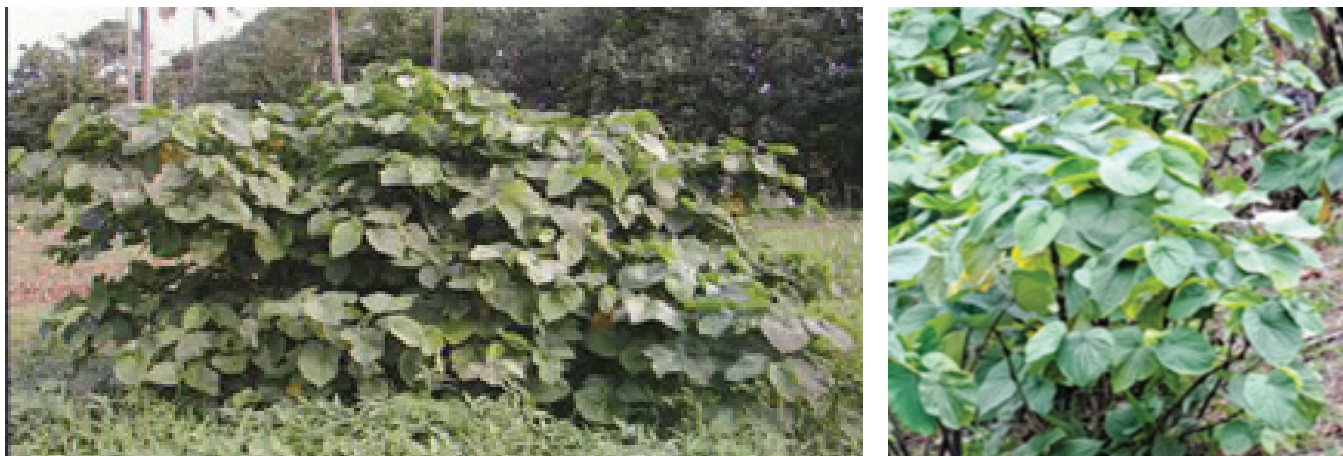


Figure 8: Choose healthy planting materials.

STEP 3: USE THE BEST METHOD OF PLANTING

Nursery is the best method to use when planting. Firstly, the healthy stems (kasa) are germinated in beds or in trays using peat moss before hardening in black potting bags. This way the roots are well established before they are transplanted to the field and reduces bacterial and fungal attack that may be present in the soil if directly planted. This process take about three months. But if planting directly to the field, plant more than one cutting in a hole as survival rates may be low.



Figure 9: The best practice is to first germinate in trays before Hardening them in black potting bags

STEP 4: PLANTING WITH INTERCROPS

It is important that kava grows in the best environment possible, to ensure plants are strong and better able to resist the effects of the virus if it comes. Kava needs shade, high humidity and protection from drying winds to grow well. This can also be done if kava is grown amongst other useful crop plants or intercrops.



Figure 10: Kava is best grown as an intercrop

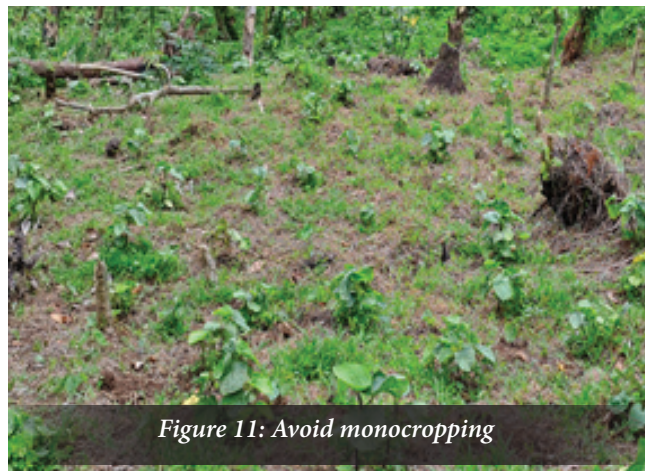


Figure 11: Avoid monocropping

STEP 5: SMART CROPPING: USING NATURAL BARRIERS TO REDUCE THE SPREAD OF THE DISEASES.

Intercrops which are non – hosts give another very useful benefit; if the virus comes in, they will block movement of virus by aphids which fly from plant to plant. Good Intercrops (none or only occasional CMV) includes Dalo, Dalo ni tana, Via, Bananas, Coconuts, Citrus, Masi, Cassava, Pawpaw, Sugarcane, Yams and Sweet potato.

Avoid planting these “bad intercrops”: Cucurbit plants (pumpkin, watermelon, and cucumber), many Solanaceous plants (tomato, tobacco, capsicum chilli, and eggplants), Leguminous plants (peanuts & snake beans), and passionfruit's and Pineapples. Just like the bad intercrops, there are some common weeds that carry the virus and these should be controlled. Some crops or weeds show signs of the virus on their leaves. Other host plants can be full of virus without showing any signs of infection.

Two of the most important examples are the weed, mile a minute and the coral tree (drala) which is a common fencing material that farmers use.

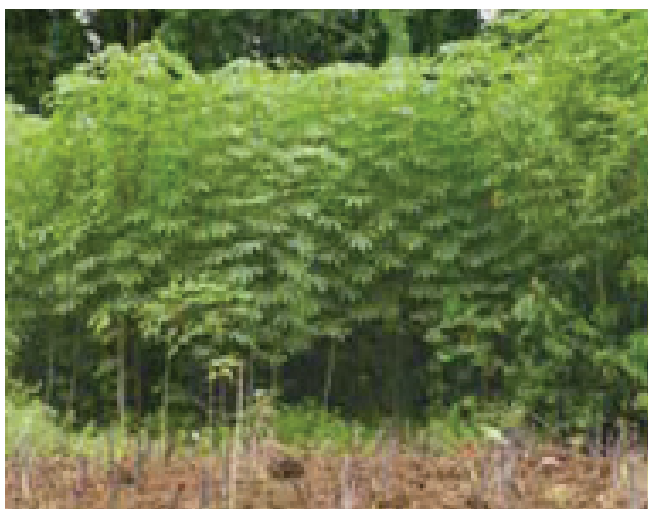


Figure 12: Dalo and Cassava are good intercrops



Figure 13: Avoid intercropping with crops like Eggplants and Pineapples



Figure 14: Keep this plant away – Drala



Figure 15: Avoid these weeds mile – a – minute and commoliea

STEP 6: ACTIONS TO SLOW SPREAD OF THE DISEASE FROM PLANT TO PLANT IF IT APPEARS

Removing diseased stems as soon as they appear can greatly reduce dieback disease development. This works because the virus cannot spread well through the whole plant.

Therefore, removing infected stems is a good way to reduce the amount of virus in the crop. Also most re-growth which are virus free will appear. It is very important though, to do this properly, in the way described below.



Figure 16: As soon as leaf symptoms appear, break off stem



Figure 17: Put disease stems straight in a bag burn & bury

HOW TO REMOVE STEMS

If the disease is present, plants must be examined every week for early signs of dieback on leaves or stems. When found, remove the stem showing these signs by breaking it off at the first node. Do not cut with knife as knife may carry the virus afterwards. Straight away, put the stems together with all its leaves in a plastic bag, empty rice or fertilizer bags and take them away for destruction either by burning or burying deep in the soil.

This method does not always work with young plants. If less than one year old, it is better to uproot and remove the whole plant. This will not be a problem if the nursery stock of young plants are kept ready for use as replacements.



Figure 18: It is important to control this disease as Yaqona has a lot of significance in the Fijian culture

SUMMARY

1. Stick to traditional method of growing; sites of small, well separated, below trees, in natural forest.
2. Make your kava plants grow strong: with good soils, intercrops and shades.
3. Start with clean plants: cut stems for planting only from healthy plants in disease free places.
4. Smart cropping: intercrop only with non-host crops.
5. Remove bags and destroy infected stems as soon as you see them.

The leaflet was produced by Mereia Fong – Lomavatu, Takaniko Kaitetara and Unaisi Turaganivalu (MASLR) and Richard Davis (SPC). A few symptom photos have been included in this version by Tolo Vasuidreketi, Ane Mataitoga and Wiliame Ligabalavu (MoAW). For further enquiries, please contact; Plant Protection Section, Koronivia Research Station, P.O. Box 77, Nausori, Fiji. Phone (679) 3477044