The OPRAtive Word

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Mikania micrantha (Mile-A-Minute Vine)

Current knowledge and control

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Mikania micrantha leaves and flowers

THE PROBLEM

Mikania micrantha (*mile-a-minute*) is a fast growing vine that actively smothers the vegetation it grows upon. It will grow vigorously in a wide range of habitats, and has become a major pest in some oil palm growing areas, especially in West New Britain, Papua New Guinea. It is currently known in nine provinces namely: East New Britain, West New Britain, Bougainville, Central Province, Madang, Manus, Morobe, Sandaun and New Ireland. Although this plant possesses medicinal properties (*anti-microbial*), it is regarded as a pest because it is so fast-growing and will rapidly smother the host plant with a thick mat of entangled growth.

DESCRIPTION

Mikania micrantha H.B.K, is a creeping or climbing vine-like plant from the family *Asteraceae*.

It grows as a typical vine with opposite pairs of leaves that are heart-shaped or broadly triangular, with an acute tip and broad base. The leaves point downwards, with the leaf tips pointing at the ground. The stems may be either covered in sparse short hairs (*pubescent*), or are hairless (*glabrous*). It is a perennial plant (*living for many years*) although the upper branches may die out after flowering leaving lower portions to regenerate new vines.

Individual flowers are either white or a very pale shade of greenish-white; they develop in dense terminal corymbs (*flowers formed on lateral stalks of different lengths with the longest at the base, so forming a flat-topped cluster of flowers*). Each seed which is black, has a terminal tuft (*pappus*) of hairs which act like a parachute to facilitate wind or mammalian dispersal.

The plant may also reproduce vegetatively from broken stem pieces - every node on the stem is capable of producing roots.

HABITAT

Mikania vine is an alien species that was introduced (*probably accidentally*) from Central or South America. It also occurs naturally in the Caribbean.

Use of this plant as cattle feed, as cover crop or even as an ornamental has encouraged its spread.

It grows strongly on areas of disturbed ground, especially in humid or shaded habitats, and it is thought that it also interferes with the soil nitrification process. It will grow in a wide range of habitats from 0-2000 m

BIOLOGY AND ECOLOGY

Mikania is a very long-lived plant with the ability to rapidly form dense smothering mats. The seeds are wind or animal borne, and number between 32-38. They germinate readily and the young plants grow fast, rapidly smothering the host. Where the *Mikania* plant may have been damaged or broken, any fragments touching the soil may also grow roots and develop into new plants.

CONTROL

The control options currently available are:

PHYSICAL

The vine may be manually removed, slashed or dug up with a hoed. These management options are very labour intensive and time consuming and often not effective because any piece of vine left on the ground is capable of producing roots and the plant grows rapidly back again. This control method does not destroy any viable seeds that may be on/in the ground.

CULTURAL

Burning the cut and dry *Mikania* plants on site is useful, but is only applicable in limited situations, where there is no risk of damage to nearby crops,

Mikania growing over oil palm

Mikania smothering a food garden

natural vegetation or property.

Mulching (smothering the vine) with dried leaves of other plants is effective, but only in the short term as *Mikania* will grow across and over to the mulch from the outside: it will not help with vines that are climbing upon other plants (e.g. oil palm or bananas). The use of synthetic material such as plastics to smother the plant is not realistic in subsistence farming or Oil palm production systems in PNG.

Chemical

Herbicides such as Glyphosate 1% (Roundup™) + a surfactant (Li 700), and 2, 4-D are also used effectively. Paraquat is seldom used as it is only a defoliant. Herbicide treatment requires regular re-treatment in heavy stands, and together with the high costs of such herbicides there are environmental and Health and Safety risks associated with their use. Smallholder growers will find the expense of regular herbicide use a great burden, and as a result a great deal of effort is now being put into using other control methods such as regular slashing.

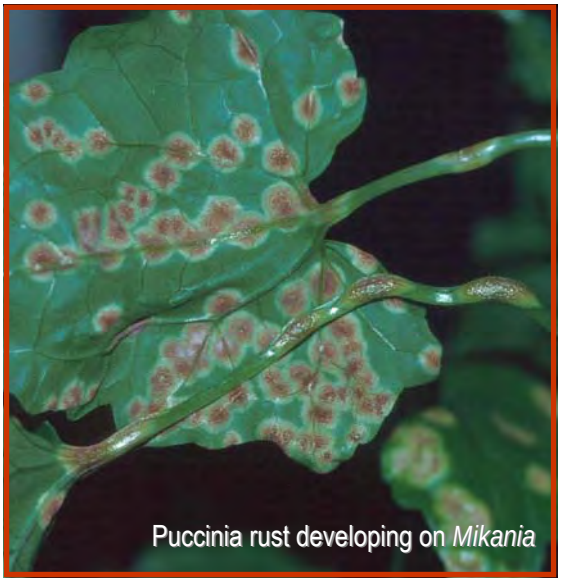
Biological

The *Mikania* vine has no natural enemies in Papua New Guinea. This makes biological control a feasible option for long term effective management of *Mikania*. A major regional project led by the Queensland Department of Primary Industry and coordinated by the Secretariat of the Pacific Community and funded by ACIAR (*implemented in PNG by PNGCCI and PNGOPRA and in Fiji by the Ministry of Agriculture*) plan to introduce recently identified natural enemies to manage this pest in Papua New Guinea and Fiji.

Biological control will not eliminate the vine, but by limiting its growth it is hoped that it will reduce the serious threat that this plant poses to both food crops and to oil palm production.

A) Rust

The first series of investigations in East and West New Britain will trial a "rust" fungus called *Puccinia spegazzinii*. Rigorous testing against many plant taxa has shown that the fungus will only attack *Mikania* and that no other plant species will be affected. Once clearance from PNG NAQIA has been received to permit the importation of the fungus into PNG, the fungus will be multiplied on plants reared in outside shade-house conditions. Once the plants have been infected, they will be returned to the field, and the development and spread of the rust and destruction of the *Mikania* plants will be closely monitored. Field based experiments are also underway to quantify the spread and growth rate of the *Mikania* plant, and to assess its affect on livelihoods and oil palm production.



Puccinia rust developing on *Mikania*

Once the *Puccinia* rust is demonstrated as being a successful control, it will be distributed throughout areas within the region where *Mikania* is a threat.

B) Butterflies

Other biological agents are also being investigated for future trials against *Mikania*. Two species of butterflies (Lepidoptera) that feed on the leaves of *Mikania* are being evaluated in Fiji. These are *Actinote thalia pyrrha* (Fabricus) and *A. anteas* (Moschler) (Lepidoptera: Nymphalidae, Acreinae).

If these are clearly demonstrated to be host-specific they will be considered for further field trials and possible introduction into PNG, once the required authority is received.

Both butterflies are currently being reared in Fiji to assess their ability to facilitate the control of this weed.

Actinote caterpillars feeding on *Mikania*

FEEDBACK

PNGOPRA welcomes any feedback on the presence of *Mikania* at any locations within PNG.

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Photographs prepared by PNGOPRA, Michael Day and Warea Orapa.

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