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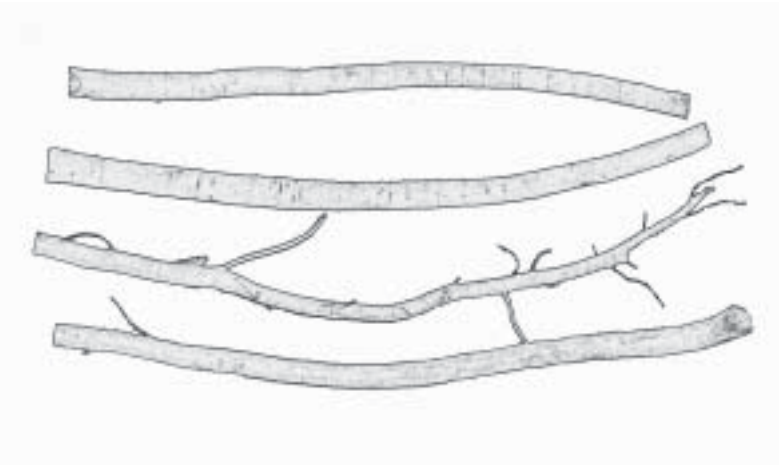
National Agricultural Research Institute

Derris Root as Pesticide



NARI TOKTOK
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THE INSTITUTE

The National Agricultural Research Institute (NARI) was established by an Act of the National Parliament of Papua New Guinea in July 1996 as a publicly funded, statutory research organisation, to conduct applied and development oriented research on food crops, alternative food and cash crops, livestock and resource management issues. Besides applied and adaptive research, NARI is responsible for providing authoritative technical, analytical and diagnostic services and up-to-date information to the entire agriculture sector in PNG. The major targets are the smallholder semi-commercial farmers in the country.

The mission of NARI is to contribute, through applied research and technical services, to the development of the agriculture sector and realisation of the national goals by identifying, adapting and transferring agricultural technologies and information, so as to:

- Enhance the productivity, efficiency and sustainability of the smallholder agriculture, and
- Improve farmer income, food security and welfare of Papua New Guineans and the nation.

This toktok was written by John Bokossou, NARI Wet Lowlands Islands Programme in October 2004. The material presented is based on the best information available at the time of printing (October 2004).

NOTES

smoke while working with derris
Do not use tools such as knife and bucket etc. for household purposes
Avoid all contact by mouth, eye and skin
Wash of splashes immediately
Do not spray in strong winds
Do not blow out clogged nozzles with the mouth
Avoid inhaling spray or dust
Wash out container thoroughly and dispose leftovers never in lakes or rivers
Shower after spraying
Keep dry roots in closed and labelled containers.
Store in a safe place
Keep away from children
In case of accident, seek medical advice
Ensure that all the safety precautions are observed

Derris elliptica

Derris elliptica is commonly known as *Posin rop for fish, or New Guinea Dynamite.* The Tolai name is Avun. The plant is a bushy, leguminous vine usually found near a river or a creek. It has bright green leaves that have 9 to 13 sword shape or oblong leaflets with pronounced pointed tips. The flowers are pink to rose-white and grow in grape-like clusters of 15 to 25cm length. The fruit is a brown leathery pod with one to three flat seeds. The root has a milky sap, which contains Rotenone, the chemical used as pesticide that kills a range of leave eating insects.

Production

Nursery

Derris can be grown from cuttings. The mother plant selected for cuttings should contain a lot of milky sap in their roots. This ensures a rich harvest in Rotenone and

Figure 1: Derris leaf with pointed oblong leaflets

therefore a potent insecticide.

Derris plants are propagated by cuttings taken from mature stems. The cuttings should be about 30cm long and taken from the older woody parts of the plant with at least three buds. Remove all of the leaves to avoid the cutting from wilting. The cuttings are planted in sand mixed with topsoil and watered daily to hold the soil thoroughly wet. The planting area must be shaded to avoid wilting. After three to four months, about 60% of the cuttings will have produced enough roots to be ready for field planting. Figure 3 shows a Derris plant propagated by the Cutting Method after three month and ready for field planting. It has to be considered, that

Figure 2: Derris flower

4. Spray the whole plant thoroughly until all the leaves are wet. Make sure that both, the top and bottom of the leaves are sprayed. If there is no pressure sprayer available, there are other ways to put the mixture on. A plastic bottle which has holes in the lid or even a broom will do to wet the plant by splashing the solution all around the leaves.
5. The waiting period is five days. This means you must wait at least five days after spraying before you eat the crop.
6. Rotenone is very poisonous for fish and so should not be used near fish ponds.

Rotenone is recommended for all vegetables, fruit trees, ornamentals and cocoa.

Safety Precautions for Preparation, Spraying and Storage

Wear suitable protective equipment (rubber gloves)
Never prepare derris root extract in the kitchen where you prepare food and drinks
Do not eat, chew and

dried roots. The roots to be used should have a thickness of at least the size of a pencil. The equipment needed is a wooden mallet, a mortar, a bucket and a piece of lap-lap to strain the solution.

The recipe consists of a bundle of approximately 15 roots of 20 cm length (100 to 140 grams when fresh), 15 grams of ordinary soap (do not use soap powder or soap bar which contains any bleach or other active ingredients) and 10 litres water.

1. Smash the roots together with a little water and soap with the mallet thoroughly until the fibres are separated.
2. Mix the rest of the water and the smashed fibres with the soap well to wash out the rotenone. Let the mixture rest over night. Mix again for about five minutes.
3. Strain the solution through the lap-lap into the pressure sprayer. Squeeze the remaining water out of the residue. Use **immediately**. The roots should not stay longer than overnight to soak. The spray must be used immediately after preparation and should not be stored.

the production of a certain number of plants demands the double amount of cuttings.

Field

Derris grows best in wet lowland conditions but can grow well even on poor soils. This is because it is a legume and so helps to produce nitrogen

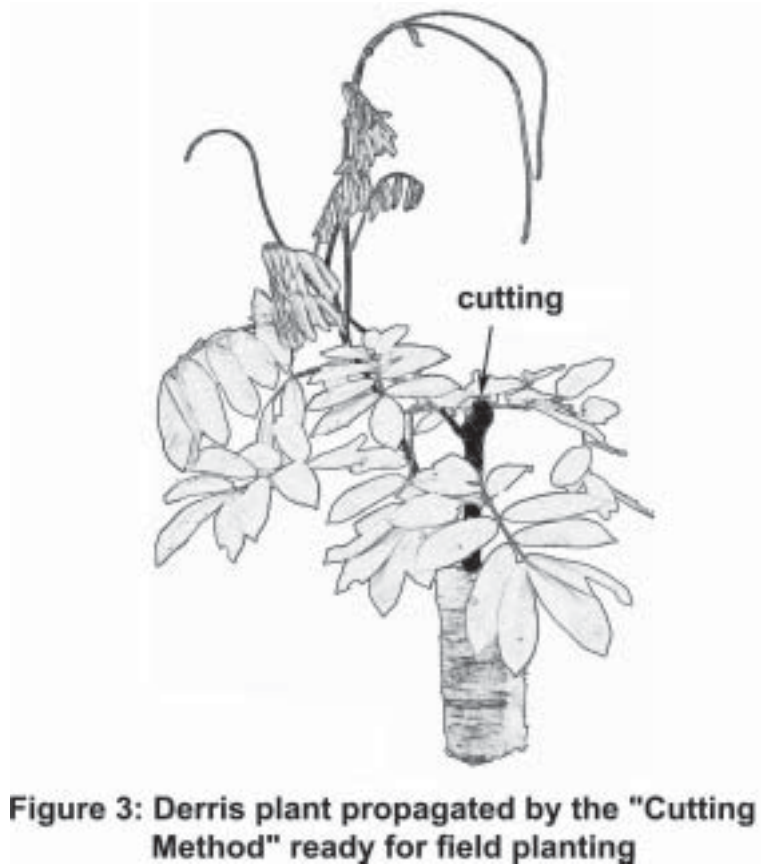

Figure 3: Derris plant propagated by the "Cutting Method" ready for field planting

that it need for good growth. Best results for root production are achieved in monocropping with no trellis to avoid climbing. The creeping vines form roots at the internodes. Climbing plants produce a single thicker root. It can be grown in tree plantations as a cover crop. A small application of about 10 grams (1tablespoon) per plant of NPK 14-14-14 at planting will help the plant to grow better and so is advisable. The best time for planting cuttings is at the beginning of the rainy season.

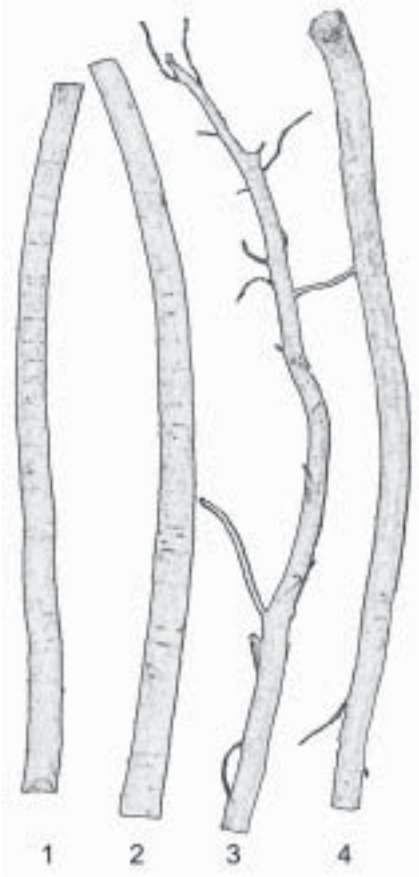

Figure 4: Derris roots for pesticide use, except No. 3, which is too young to use

Harvest

In fertile soils, root production begins

in four to five months. The cuttings need to grow for one and a half to two years to get the maximum root production. Figure 4 shows the minimum size of the roots to harvest. The thickness of the roots should be at least that of a pencil to ensure good rotenone content for good pest control.

Derris Root extract as pesticide

The Rotenone found in the roots of the derris plant is poisonous to plant eating insects. By spraying the derris root extract on field crops the insect pests get poisoned die. Derris can kill a range of insect pests including aphids, beetles, thrips, mites and caterpillars. Rotenone is a powerful pesticide if it is used in the proper way. The formula is photo- and temperature sensitive. This means, that it gets destroyed easily by sunlight and heat. So the application must be done when it is cool early in the morning, late afternoon or on a cloudy day. If Derris is applied in this way, it can give good pest control for up to 1½ weeks.

Preparing the spray

The extract can be prepared from fresh or