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A POTENTIAL BIOLOGICAL CONTROL AGENT FOR MIMOSA INVISA WEED IN PAPUA NEW GUINEA

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ABSTRACT

The syllid, Heteropsylla spinulosa, introducded from Queensland into Papua New Guinea against the giant sensitive plant (GSP), Mimosa invisa, has established itself in the Markham Valley. Up to 98% reductioin in GSP seed crop was recorded from the field trials.

INTRODUCTION

Mimosa invisa Mart commonly known as the Giant Sensitive Plant (GSP) or 'nil grass' is becoming a serious weed to subsistence gardens, plantations, cattle ranches and non-productive areas in Papua New Guinea. It is very difficult to put any value to possible costs involved in controlling this weed, however, Ramu Sugar Ltd spends up to K100,000 annually on chemical control on its properties in the Markham Valley.

M. invisa is an annual leguminous weed with vines that sprawl into clumps of up to 20 m diameter are quite common in the Markham-Ramu Valleys. Seeds germinate in September/October and by May most plants start to flower. By the end of June-early July most plants would have seeded. It was estimated that up to 20,000 seeds/m^2 can be produced in one season. These seeds are distributed to infest new areas by floods, contaminated hay, dirty boots and vehicles. The seeds have a hard seed coat and can survive in the soil for many years (dormancy). Heat from grass burning is sufficient to break this dormancy for seed germination.

GSP PSYLLID

The GSP pysllid, *Heteropsylla spinulosa* is a tiny, light green, sap-sucking bug (2-3 mm long) introduced into Papua New Guinea in December, 1992 from Australia. It was shown in the field in Queensland that the psyllid was very effective in controlling *M. invisa* weed in pasture and non-productive areas. After the post-entry quarantine tests at Laloki Agricultural Research Station, the psyllid was sent to Ramu Sugar Ltd in January, 1993 for field releases at its sugarcane estate, Gusap, Madang Province.

BIOLOGY/DESCRIPTION

Adults live from 3 to 10 days and females lay an average of 15 eggs per day. The oval, yellow/orange eggs are laid on the upper surface of the GSP leaflets and are just visible to the naked eye. the immature or nymphal stages are flat, yellow (but late instar nymphs are green), prefer to feed between overlapping leaflets, and tend not to move from a feeding site during development. Adults congregate on growing tips and on the underside of leaves. Ants are attracted to, and black sooty mould often grows over the insects excretion of white, solidified drops of honey dew.

The life cycle from egg to adult ranges from 20 to 24 days. Application of nitrogen fertilizer to GSP clumps before the insects are introduced appears to enhance the breeding potential of the psyllid and hence the rapid visible impact of the psyllid on the weed. Adults can disperse over long distances on wind currents.

POTENTIAL FOR BIOLOGICAL CONTROL OF GSP

The immature stages and adult psyllids suck sap from the leaflets, leaf stems and growing tips. This feeding damage causes distorted, deformed growth with growing tips becoming thickened and brittle. Extensive feeding damage can lead to GSP seedlings and clumps dying prematurely. Surviving clumps are reduced to a mass of bare stems with stunted, brittle

growing tips, which allows other vegetation to grow through and eventually smother the GSP clumps. If large insect populations are active during the growing season of GSP, mature plants may flower but the production of seed pods is severely restricted or prevented. Up to 98% reduction in GSP seed crop was recorded from small plot trials at Ramu in early 1993.

CURRENT SITUATION - MAY 1993

Release sites were established at Ramu Sugar Estate (9), Gusap Ranch (24), Leron (1) and Munum (2). Assessments made in late May indicated that the GSP psyllid had established and appears to be breeding normally at these sites. Given the level of GSP infestations in the Markham - Ramu Valleys it will be several years yet before we can see any reduction in the GSP infestations.

Several species of ants, spiders and ladybird beetles were seen preying on the GSP psyllid at Ramu Sugar Estate but do not appear to reduce the GSP psyllid population.

FURTHER INFORMATION

For further information and supply of GSP psyllid, please contact:

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