

# Report on Field Trials carried out in Surinam, April, 1999 in collaboration with Luxan B.V.

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## **Introduction**

The use of metaldehyde for controlling apple snails in broad acre rice is poorly known. As a follow up to extensive experiments carried out in 1998, a field trial based on only 3 formulations of which several had shown promise in previous trials were carried out in April, 1999 in Surinam.

## Methods and Materials

### *Experimental Set-up*

Field trials were carried out between April 14<sup>th</sup> and April 26<sup>th</sup>, 1999 at a farm that is primarily a cattle and rice farm and is located in the Saramaca region of Surinam. The experiment was set up in eight to nine hectare (100m x 900m) rice fields separated by irrigation canals or land dams. The rice planted in these fields is GROVENI, 1a local variety developed in Surinam by SML.

In each experimental field a total of 10 experimental cages (2 x 2 m) were placed in the central area of the newly flooded fields. Each cage was placed at least 3 m apart and firmly embedded in the mud to prevent the escape of the test snails. All treatment fields were at least 100 m from each other and due to the prevailing water flow were not in contact with any of the other test formulations.

### *Treatments*

On the day before treatments began, snails were placed in the experimental cages. The number of snails that were placed in each experimental cage approximated a severe field infestation. The trial began on the 14 of April and finished on the 27 of April, 1999.

Treatments of the Flowable and the Wettable Powder were carried out the day before aerial sowing began. Thus the timetable for the trial was:

Table 1. Timetable of Surinam Trial, April, 1999

Day	Date	Action
Day -2	April 14, 1999	Snails in cages
Day -1	April 15, 1999	Wettable Powder, Flowable applied
Day 0	April 16, 1999	Granules applied, Sowing of the fields
Day 1	April 17, 1999	Sowing finished on untreated fields
Day 2	April 18, 1999	First mortality assessment,
Day 4	April 20, 1999	Second mortality assessment
Day 6	April 22, 1999	Third mortality assessment, provisional rice emergence
Day 10	April 26, 1999	Total rice emergence assessed in all treatment fields

The sowing rate for this type of rice is 600 kg per 5 ha or 120 kg/ha.

## **Results**

### ***Mortality Assessment***

Mortality was quite high at the end of the assessments though there were significant differences between formulations. In 2 of the control cages mortality was also high most probably due to low water levels. It was noticed that in several treatment cages, notably where the Wettable Powder and the Flowable had been applied, that snails that were previously observed as dead recuperated, and were then assessed as alive during the second assessment. The Flowable and the Wettable Powder had a very fast mortality rate with the Granules showing lower activity at Day 3 (Day 2 for Granules). However, near the end of the mortality assessments both the Wettable Powder and the Granules were not significantly different.

### ***Damage Assessment***

The emergence of rice plants from the different treatments showed very large differences between formulations. The final assessment clearly shows that many more plants emerged from the Flowable formulation than either of the other formulations. The control plots not surprisingly showed no emergence due to the high grazing pressure of the snails. The Granules and the Wettable Powder showed similar emergence with the Granules having slightly higher emergence though not significantly different from the Wettable Powder ( $p < 0.05$ , AOV, Tukeys test).

### ***Water Levels and Temperature***

The water levels were within range of what is considered normal in Surinam and did not fluctuate more than 2 cm for the trial. The depths on for both the Granules and the Flowable having slightly higher levels than both the control and Wettable Powder.

Water temperatures were also normal for this time of year. Midday temperatures reached a maximum of 34°C while night-time temperatures dropped to around 23-24° C, perfect for snail feeding activity.

## **Discussion**

There were similar trends in mortality for both the Wettable Powder and the Flowable, with the Granules reaching a similar level of mortality by day 6 after sowing. However, the formulations showed significant differences with the Flowable showing the greatest effectiveness with regards to reducing feeding damage to rice seedlings. This is an interesting result and may be explained by the re-

duction or cessation in feeding activity by the majority of snails in the Flowable treatments. In contrast, several snails were seen to be moving and feeding in both the Wettable Powder and the Granules on day 2 after sowing and with the Granules on day 4 also. These few individuals could be responsible for the majority of rice damage in the test cages, as the snails are voracious feeders on small rice plants.

The different products also handled quite differently. The Wettable Powder mixed well but had to be mixed outside the hopper to make sure the material had no clumps. As well the Granules was mixed directly with the sowing paddy in the hopper at the time of sowing thus reducing costs even more. However, there seem to be some problems with achieving even spread of the material across the treatment field. In addition both the Flowable and Wettable Powder formulations showed at least 10% drift according to 2 observers at the treatment fields. This also reduces efficacy and while spraying on still days is the best option, this is sometimes not a possibility in Suriname.