



# Technotes

## Barrack Betterstick™ Even Better Protection with Superior Rainfast Properties

### Introduction

Barrack Betterstick is an excellent new formulation of chlorothalonil developed by Crop Care that has been shown to provide long lasting residual protection for control of a wide range of plant diseases. In order to test Barrack Betterstick against existing chlorothalonil formulations, Crop Care has conducted a series of tests and commissioned a series of trials by an independent research organization to compare the rainfast properties of Barrack Betterstick with the existing commercial formulation of chlorothalonil, Bravo® Weather Stik®.

The first of these tests was conducted in our Formulation Research Laboratory at Brendale in Brisbane. A series of glass slide tests were conducted to compare the adhesive properties of

formulations before and after being subjected to a “wash off” test. In these tests, glass slides were sprayed with a 1.5% (1500 mL/100L) mixture of the chlorothalonil formulations and water to the point of runoff. The total amount of chlorothalonil retained on the slides was then measured by gas chromatographic analysis for each of the formulations. After allowing the slides to dry, similar sprayed slides were sprayed with 10mm of water (simulated rainfall). The runoff water was collected from each of these slides and the amount of chlorothalonil contained in the runoff as well as that retained on the glass slides was again calculated by GC analysis. The results of these analyses are shown in Figure 1 below.

### Brendale, Qld - 2006 Laboratory Trial Retention Before and After Rainfall (10mm) Chlorothalonil Retained on Glass Slides (mg) Sprayed to Runoff

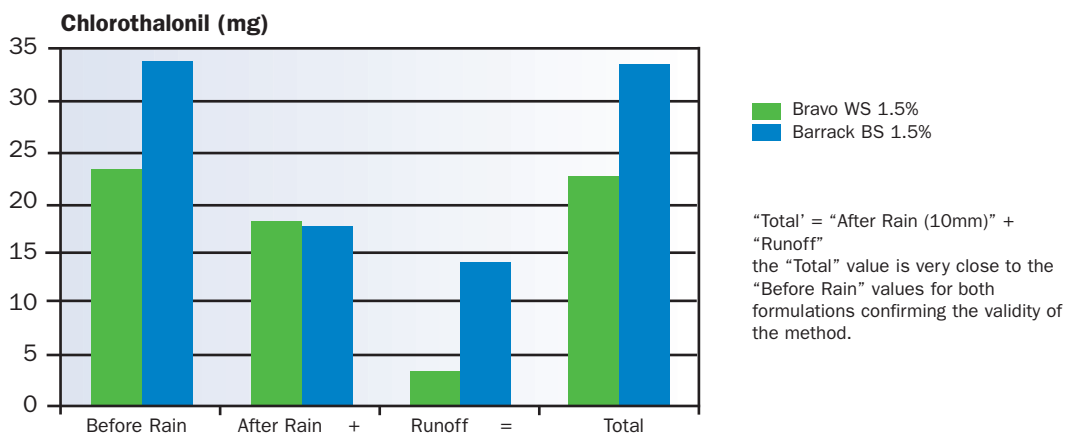


Figure 1. Comparative adhesion and sticking ability of 2 formulations of chlorothalonil before and after rainfall.

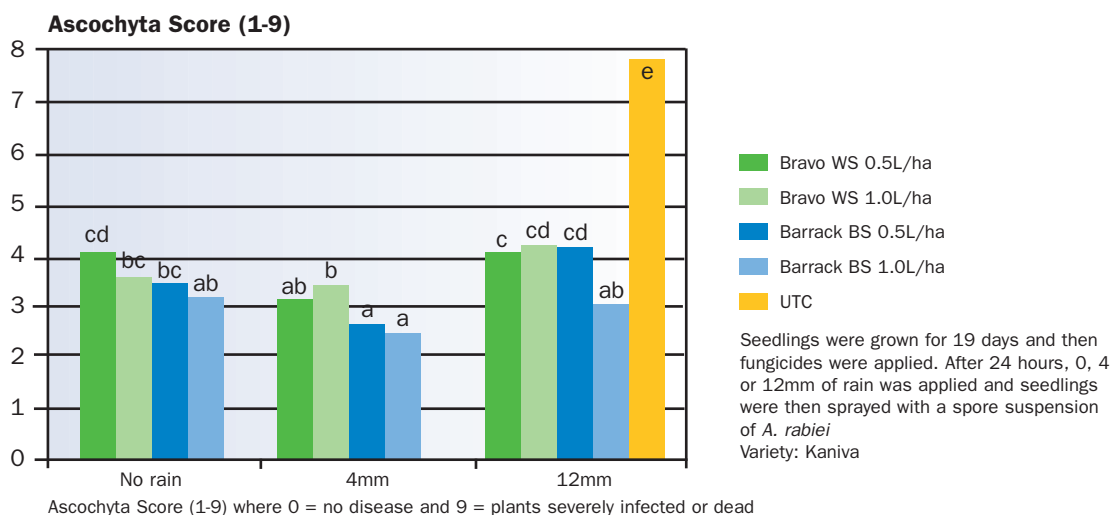
These results show that Barrack Betterstick adhered more strongly to glass than Bravo Weather Stik when both were applied to runoff at a 1.5% concentration. Following 10mm of simulated rainfall, similar amounts of the active ingredient was retained on the glass slides for the 2 formulations.

Following the encouraging results obtained from the glass slide tests a series of glass house and field bioassays were conducted to compare the formulations. These trials were conducted by Eureka! AgResearch at their research facilities at Werribee in Victoria.

## Werribee, VIC. - 2005

### Ascochyta Control – Effect of Rainfall

#### Disease Severity 16 Days After Treatment and Rainfall



Source: Eureka! AgResearch Trial. LSD (P=0.05) Columns with a common letter(s) are not significantly different.

Figure 2. The affect of rainfall on control of Ascochyta Blight in chickpeas from 2 formulations of chlorothalonil.

Even at half the recommended rate of application, Barrack Betterstick provided good control of Ascochyta Blight in chickpeas. At the recommended rate of 1L/ha, better control of Ascochyta Blight was obtained after either 4 or 12mm of rainfall than the commercial product Bravo Weather Stik. It was also interesting to note that 4mm of rain had no negative affect on disease control and in fact seemed to slightly improve the level of control. This was consistent with both formulations. This data supports the advice that a small amount of rain or heavy dew will assist in the redistribution of chlorothalonil to provide better coverage of the entire crop canopy.

The 12mm of rain did reduce efficacy of both formulations. However at the recommended rate it had the least affect on Barrack Betterstick, where differences between different rainfall

In the first of these trials, Barrack Betterstick and Bravo Weather Stik each at 2 rates of application were compared for control of Ascochyta Blight on chickpeas following different levels of simulated rainfall and artificial inoculation with *Ascochyta rabiei* spores. Both fungicides were applied 19 days after planting and prior to the rain and infection, as they are strictly protectant fungicides. Fungicides were applied in 50L/ha one day prior to inoculation and rainfall. Simulated rainfall was applied at 0, 4 or 12mm at an intensity of 21mm/hr. The results of this trial are shown in Figure 2 below.

levels were not significant when applied at 1L/ha. This was not the case for Bravo Weather Stik.

In the second trial, Barrack Betterstick and Bravo Weather Stik each at 2 rates of application were compared for control of *Botrytis cinerea* leaf infection on tomatoes in a glasshouse environment. Tomato seedlings were grown for 22 days after transplanting. Fungicides were then applied in a total water volume of 50L/ha. The following day the transplants were subjected to 3 levels of simulated rainfall 0, 12.5 and 25mm at an intensity of 42mm/hour. Artificial inoculation with a *Botrytis cinerea* spore suspension was then conducted by misting the foliage. The results of this trial are shown in Figure 3 below.

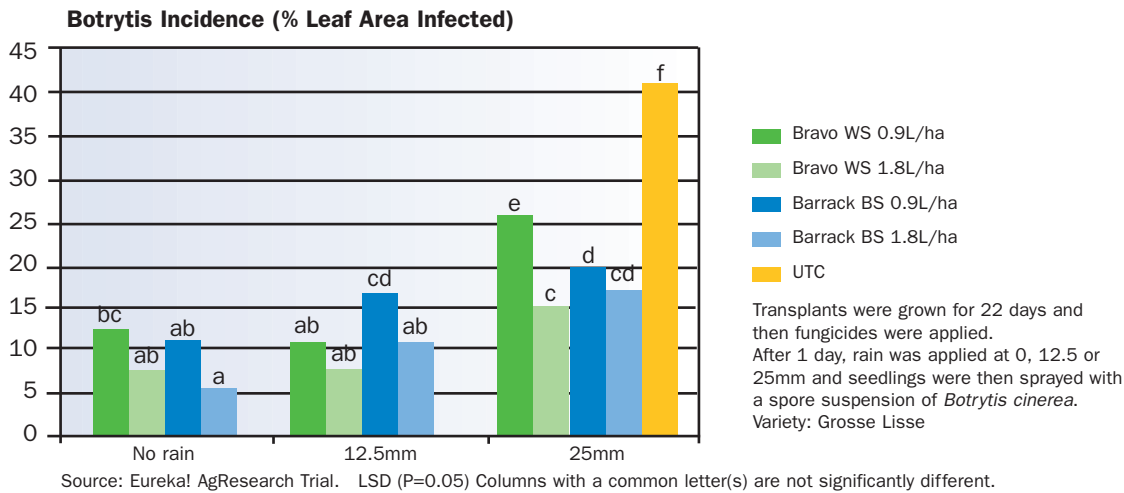
**Werribee, VIC. – 2006****Botrytis Control – Effect of Rainfall****Disease Incidence 16 Days After Rainfall and Inoculation**

Figure 3. The affect of rainfall on control of Botrytis in seedling tomatoes from 2 formulations of chlorothalonil.

Overall, there were only small differences in performance between the 2 different formulations with no significant differences between the products when compared at the recommended rate (1.8L/ha) and after the same rainfall. All these treatments provided good Botrytis control compared to untreated plants with infection ranging from 5 to 17% compared to 42% on untreated plants. There were also only minor differences in Botrytis control between no rain and 12.5mm for both formulations when comparing the same rate of application. The biggest differences in the trial were higher infection levels following 25mm of rain compared with the other rainfall levels, particularly at the low rate of application. However, infection levels were still below 20% for both formulations at the recommended rate of 1.8L/ha.

## Conclusions

### • Excellent Rainfast Properties

Once dry on the leaf, Barrack Betterstick adheres strongly to leaves and has rainfast properties at least equal to leading industry standards. If applied to wet leaves, good adhesion is also possible, since excellent performance has been observed if Barrack Betterstick is applied to plants that have heavy dew on them. This may be a useful method of obtaining some redistribution to the lower canopy of heavy crops.

Barrack Betterstick is not yet registered for use in Australia. An application for registration has been lodged with the Australian Pesticides and Veterinary Medicines Authority.

Barrack Betterstick trademark pending.

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These properties combined with the other advantages of Barrack Betterstick listed below make it the natural choice for superior protection from diseases.

### • Broad Spectrum of Disease Activity

Barrack 720 has good activity across a wide range of pathogens that include many of the major foliar fungal diseases of tree, vine, vegetable and grain legume crops grown in Australia.

### • Multi Site Fungicide and Resistance Management

The active ingredient in Barrack Betterstick, which is chlorothalonil belongs to the Group Y of fungicides. There has been no known development of resistance from disease pathogens to chlorothalonil and so the risk of resistance development is considered to be negligible. This makes Barrack 720 an excellent product in spray programs from a resistance management point of view.

### • Minimal Impact on Beneficial Insects

Studies have shown that chlorothalonil has little affect on beneficial insects and mites, which makes it very compatible with IPM systems in a range of crops where this is important such as vines and stonefruit.

