ViVUS MAX PLUS Optimol

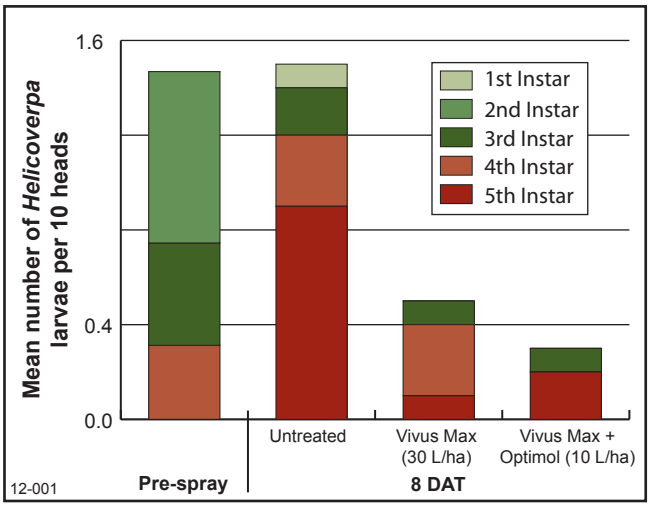
Biological Insecticide Optimiser

SORGHUM LOW VOLUME AERIAL APPLICATION

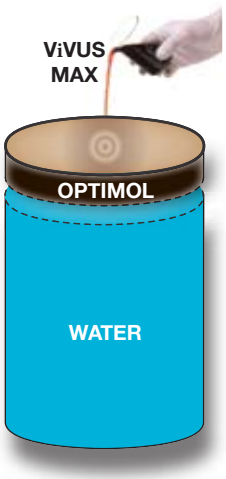
Background

In sorghum, aerial application of ViVUS Max is often the only option available to growers - due to lack of high clearance rigs, wet conditions or the need to cover large areas quickly. Low water application volumes (down to 10 L per hectare) can be used successfully with Vivus Max due to the unique structure of sorghum and because *Helicoverpa* feed almost exclusively on the head. Low application volumes can greatly improve efficiency (in cost and/or time) of aerial applications of ViVUS Max compared to ultra-low volumes (ULV - 3 L oil per hectare) and higher volume applications (30 L water per hectare); however, low volumes increase the risk of poor coverage, particularly through droplet evaporation.

To maximize coverage and performance of low volume aerial applications in sorghum, AgBiTech has registered ViVUS Max to be applied in a total volume of 10L water per hectare with the addition of Optimol at 1 L per hectare. This approach can significantly lower the cost of control and allow rapid treatment of large areas during the short *Helicoverpa* control window in sorghum, while retaining high performance.



Performance of ViVUS Max applied by air at 30 L/ha alone and at 10 L/ha + Optimol (at 1 L/ha) in sorghum



	MIXING ORDER
75 to 150 mL per hectare of ViVUS Max	3rd
1 L per hectare of Optimol	2nd
9 L per hectare of water	1st

ViVUS Max Draft Label Application Instructions:

Aerial – Low Volume (Sorghum Only)

Apply in a minimum of 10 litres of water per hectare and include Optimol at 1 litre per hectare (ViVUS Max + 1 L Optimol + 9 L water per hectare).

Compatibility and Mixing Instructions:

If mixing another product with ViVUS Max + Optimol in 10 L per hectare, users must follow the directions on the other product label. Optimol has a low pH and can act as an acidifier when using high pH water. Ensure the final spray solution has a pH of 8.5 or less.

What is Optimol?

Optimol is a blend of molasses (containing sucrose, glucose and fructose), sucrose and petroleum oil designed and developed to optimise the performance of ViVUS Max. It has no insecticidal properties on its own but when mixed with ViVUS Max can improve spray coverage and increase residual control; resulting in higher mortality and faster speed of kill of *Helicoverpa* spp. larvae under certain conditions.

How does Optimol work?

Optimol improves the performance of aerial applications of Vivus Max in several ways:

(i) *Improves spray coverage* - The petroleum oil component of Optimol reduces droplet evaporation. This is particularly valuable in hot, dry conditions (above 30°C and below 40% relative humidity) where spray droplet evaporation can reduce coverage.

(ii) *Improves residual activity* - The sugars and oil in Optimol combine to increase the longevity of NPV after application. The sugars provide a stable, acidic microclimate that is more suitable for NPV on the plant surface. The oil component reduces the damage to NPV caused by UV light.

(iii) *Increases initial uptake and infection* -Studies indicate that the molasses, sugar and oil components in Optimol combine to greatly increase NPV infectivity, however the mechanism for this is not fully understood. It may be due to a feeding stimulant effect from the sugars. However research indicates it is more likely caused by interactions inside the gut of the larva. It is suggested the Optimol components protect virus particles from inactivation by plant chemicals inside the gut, and may also increase larval susceptibility to NPV.

Application timing

Research shows that the majority of larvae controlled by Vivus Max ingest the virus within the first few hours after spraying. This means that along with achieving good spray coverage, it is important for targeted larvae to be actively feeding. *Helicoverpa* feed most actively at 25°C to 35°C -the optimum temperature range for applying ViVUS Max. Temperatures below 25C will reduce the activity of larvae, leading to reductions in feeding and hence virus ingestion. Below 18°C activity is reduced even further, and below 12°C larvae stop feeding.

It is preferable to delay application of ViVUS Max until conditions warm, however control can still be achieved in cooler conditions provided temperatures have been at least 15°C for several hours prior to spraying. Where application cannot be delayed the addition of Optimol will increase rates of infection and improve the residual life of NPV on the crop.

Applications following cold summer nights

Abnormally cold nights during summer (when temperature drops below 12°C) can cause larvae to suffer from cold shock. These cold nights are often followed by warm and sunny days that seem ideal for ViVUS Max use. However, larvae remain in cold shock for several hours, and may not start actively feeding until late morning, by which time NPV will undergo significant UV degradation on exposed sorghum heads. In these situations, the addition of Optimol to early morning sprays of ViVUS Max will improve NPV persistence because the active ingredients in Optimol extend the residual life of NPV by reducing the damage to viral DNA caused by UV light.

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ALWAYS READ THE PRODUCT LABEL PRIOR TO USING VIVUS MAX AND OPTIMOL

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