



# EXCALIA<sup>®</sup>

FUNGICIDE

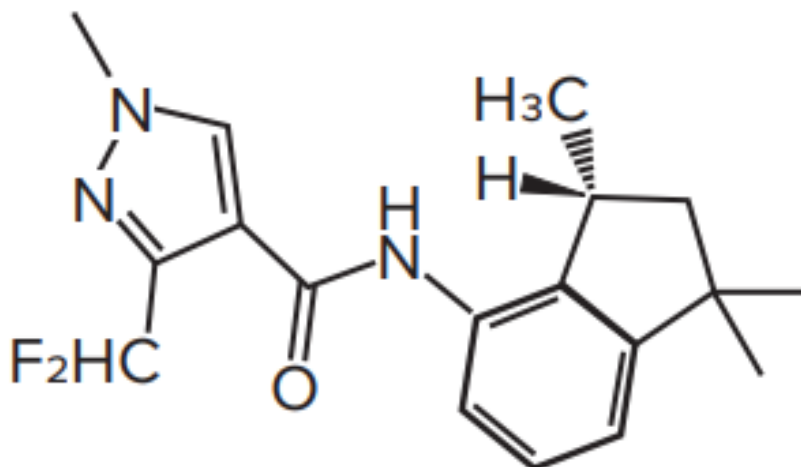
**THE NEW STANDARD FOR  
DISEASE CONTROL IN BANANAS**

Bananas Technical Guide



Excalia is a new fungicide from Sumitomo that provides the highest level protection against Yellow Sigatoka leaf spot in banana crops.

- Mode of Action: SDHI (Group 7)
- ISO Chemical Name: Inpyrfluxam
- Active Ingredient Name: INDIFLIN®
- 400g/L SC (Suspension Concentrate) formulation for excellent compatibility and usability.
- Registered for air and ground application in bananas.
- Rainfast in 2 hours.



## Mode of Action

Excalia is a novel fungicide discovered by Sumitomo and belongs to a class of compounds known as succinate dehydrogenase inhibitors (SDHI) that have a mode of action inhibiting the energy production process in pathogenic fungi. New generation SDHIs that are highly active on pathogenic fungi possess pyrazole rings. Sumitomo Chemical was the first company to discover these pyrazole rings. Through later optimisation the active Indiflin (Inpyrfluxam) was synthesised to create one of the most active compounds in this group.

## Yellow Sigatoka in Bananas

Yellow Sigatoka is a fungal disease in bananas that causes leaf lesions and is commonly referred to as Leaf spot. The fungal plant pathogen that causes the disease is *Mycosphaerella musicola* also known as *Pseudocercospora musicola*.

Yellow Sigatoka occurs in all banana growing regions of Australia but is especially common in Far North Queensland, particularly during the wet season when conditions are warm and moist.

The disease lesions result in premature leaf death which reduces the plant's ability to photosynthesize, impacting bunch size and delaying bunch filling.

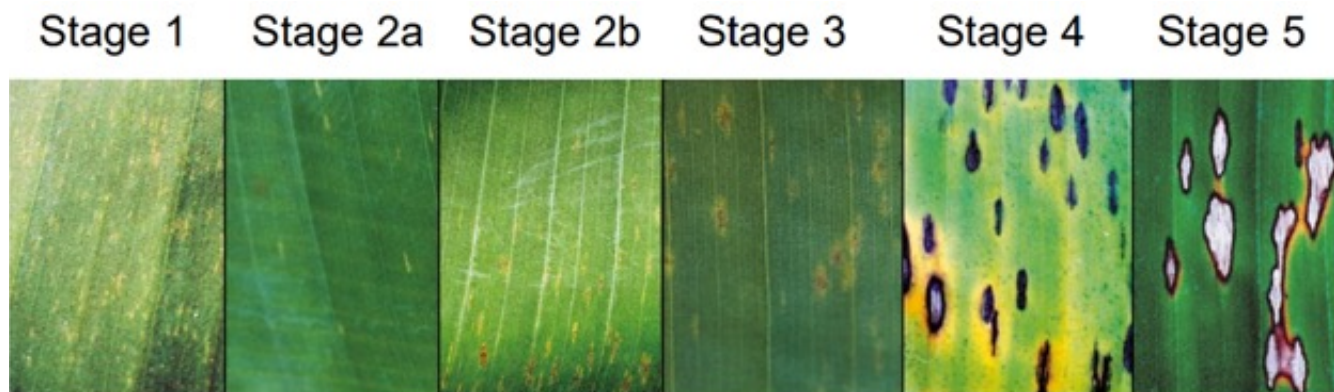
If left uncontrolled or unmanaged significant losses in yield and fruit quality are expected.

When controlling Yellow Sigatoka both chemical and cultural methods should be utilised in an integrated approach. It is important to first reduce inoculum levels by removing diseased leaves, often referred to as 'de-leaving'. As a rule leaves with more than 5 per cent of the surface area affected by Yellow Sigatoka should be removed.

An ideal approach to managing Yellow Sigatoka will incorporate de-leafing as well fungicides and a range of other cultural practices including,

- Avoiding placing blocks close to waterbodies, as increased humidity will increase disease.
- Utilise lower density plantings as it encourages a drier microclimate within the canopy.
- Maintain good drainage to ensure water does not sit within interrows.
- Reduce plant-to-plant contact by removing unnecessary suckers.

Fungicides like Excalia are an important part of an integrated disease management program for managing Yellow Sigatoka and their longevity and effectiveness can best be preserved through following a resistance management program that includes de-leafing, rotation of different modes of action and the use of mixtures with fungicides with low resistance levels.



The progressive development of Yellow Sigatoka symptoms through 5 stages on the leaf can be seen in this illustration from, *The Better Bananas*, Department of Agriculture and Fisheries Qld.



Advanced Yellow Sigatoka (*Mycosphaerella musicola*) lesions and necrosis on the leaves of young bananas.



## Directions for use

CROP	DISEASE	RATE	CRITICAL COMMENTS
Bananas	Yellow Sigatoka	185mL/ha plus high quality water miscible mineral crop oil at 3-5 L/ha	<p>EXCALIA should be applied as part of a regular program of fungicide sprays, alternating with fungicides from different mode of action groups. Intervals between fungicide applications generally should be 14-21 days. Use shorter intervals under conditions of high disease pressure, wet weather, and high leaf emergence rate.</p> <p>De-leafing in accordance with industry guidelines to remove old and diseased leaves should continue along with fungicide use to reduce inoculum.</p> <p>EXCALIA should be used with a high quality miscible mineral crop oil at 3-5 L/ha. Use a higher oil rate with higher disease pressure.</p> <p><b>Apply a maximum of 3 applications of EXCALIA to any banana block in a 12 month period.</b></p> <p>EXCALIA should be diluted with sufficient water to ensure thorough coverage of all leaf surfaces. Use a minimum of 30 L/ha when applied by air.</p>

### Aerial application

Apply Excalia Fungicide in at least 30 L of spray mixture per hectare for aerial application. Use suitable application parameters (nozzles, pressure, speed, etc.) to deliver only a MEDIUM spray droplet size category.

### Ground application

Apply Excalia Fungicide in sufficient water, using suitable application parameters (nozzles, pressure, speed, etc.) to ensure thorough and even coverage of the target crop. Except when applying with orchard airblast equipment, use only MEDIUM spray droplet size category.



## Mixing

Shake well before use. Half fill the spray tank with clean water, pour in the required quantity of Excalia Fungicide, with agitators running, and then add the high-quality water miscible mineral crop oil followed by the remainder of the water and mix well. Use spray mixture immediately after preparation, do not allow it to stand.

When mixing with other products the mixing sequence recommended is: water soluble bags, dry flowable or water dispersible granules, wettable powders, water based suspension concentrates, water soluble concentrates, oil based suspension concentrates (Excalia), emulsifiable concentrates, adjuvants and surfactants then finally soluble fertilisers.

## Compatibility

Excalia Fungicide is compatible with many commonly used fungicides, liquid fertilisers, herbicides, insecticides, and biological control products. However, since the formulations of products are always changing, it is advisable to test the physical compatibility of desired tank mixes and check for adverse effects like settling out. When mixing with a high-quality water miscible mineral crop oil as per the label recommendation Biopest\* Paraffinic Oil was used in development trials and is recommended by Sumitomo.

## Sprayer clean-up

If clean-up is required, clean spray equipment by rinsing all application, pumping and mixing equipment twice with clean water after use.

## Restrictions

**DO NOT** harvest for 1 day after application.

**DO NOT** apply if heavy rains or storms are forecast within 3 days.

When applying Excalia by air a minimum of 30 L/ha of water should be used, with a MEDIUM spray quality, check the label for downwind buffer zones.



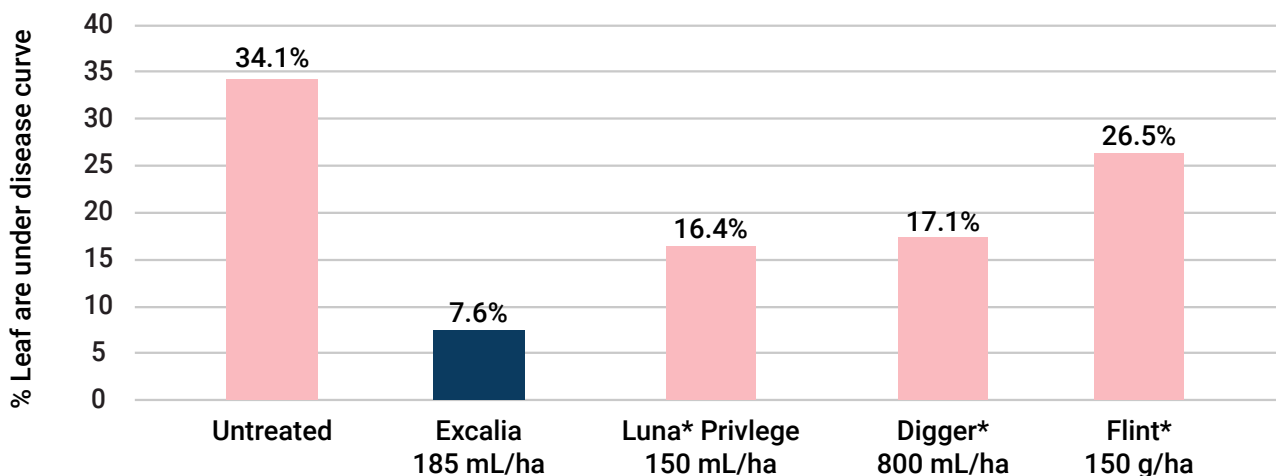
## Trial Results and Field Testing

Excalia - Foliar trial for Yellow Sigatoka. Tully, Queensland, 2016.

5 spray program at 2 week intervals. Excalia treatment included Biopest\* oil at 3L/ha.

F15-016-2399-BAN

### Area under disease progress curve (leaf 6 to leaf 12)



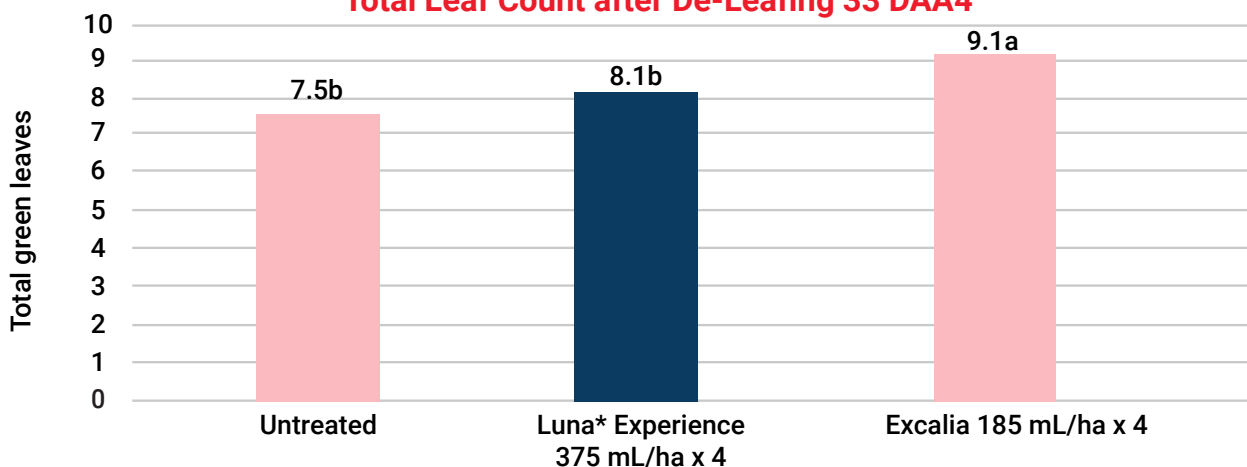
$P = 0.0059$

Excalia - Foliar trial for Yellow Sigatoka. Innisfail, Queensland, 2023.

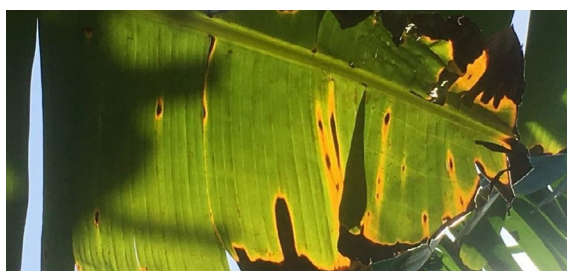
4 spray program at 2 week intervals. Sprayed at 276 L/ha by ground. Excalia and Luna\* Experience sprays included Biopest\* oil at 3L/ha.

F23-001-2399-BAN

### Total Leaf Count after De-Leafing 33 DAA4



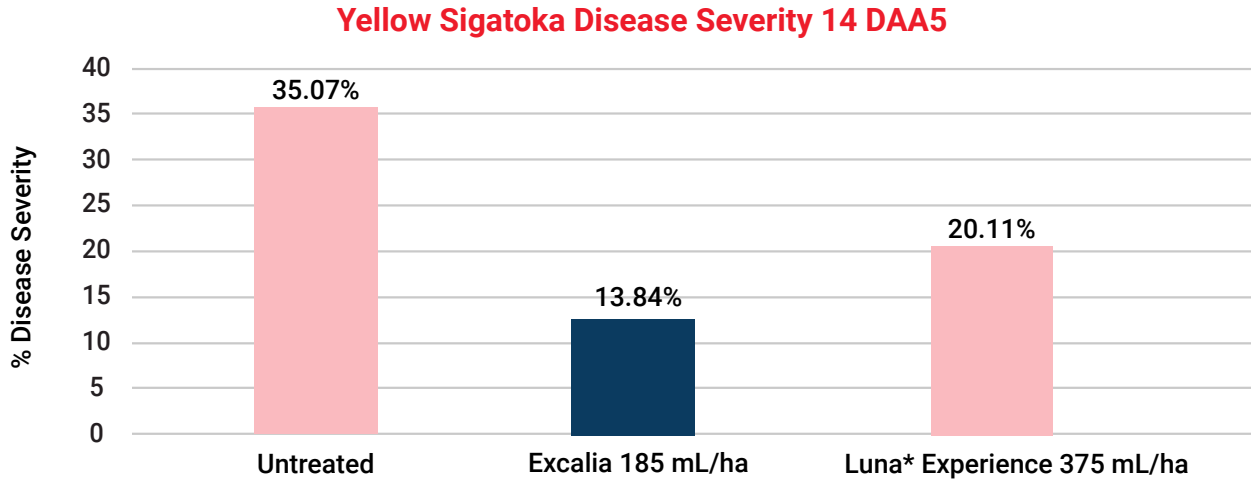
$Prob (F) = 0.055$



Leaves from the trial site showing typical symptoms of Yellow Sigatoka (*Mycosphaella musicola*)

**Excalia - Foliar trial for Yellow Sigatoka. Innisfail, Queensland, 2021.**  
**5 spray program at 2 week intervals. Sprayed at 215 L/ha by ground. Excalia and Luna\***  
**Experience sprays included Biopest\* oil at 3L/ha.**

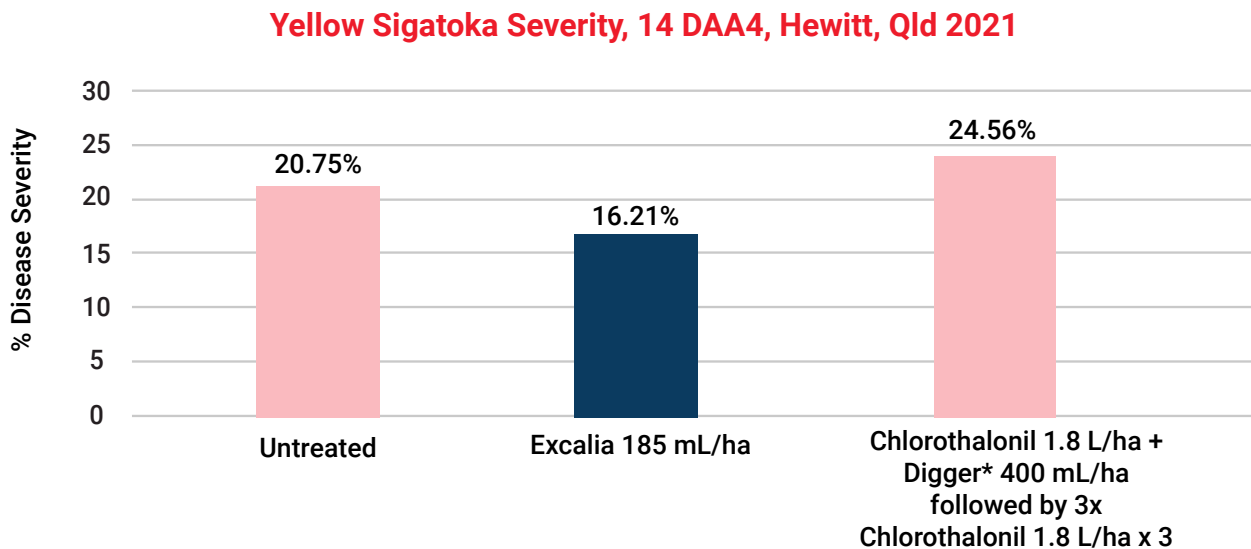
F21-009-2399-BAN



LSD = 0.05

**Excalia – Foliar application trial for Yellow Sigatoka in bananas cv. Cavendish, Hewitt, Queensland, 2021.**  
**4 spray program at 2 week intervals. Sprayed by rotary wing aircraft at 30 L/ha of water.**  
**Excalia treatment included Biopest\* oil at 3L/ha.**

F20-006-2399-BAN



P = 0.018102





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**EXCALIA™**  
FUNGICIDE



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