



MINISTRY OF LANDS,  
AGRICULTURE, FISHERIES,  
WATER AND RURAL  
DEVELOPMENT

## PEST ALERT

# *DROSOPHILA SUZUKII*

### SPOTTED WING DROSOPHILA (SWD)

*Drosophila suzukii* was detected on Blueberry orchards in four (4) provinces in South Africa. The fruit fly pest causes damage to many fruit crops, especially on soft fruits and berries. Unlike other *Drosophila species*, SWD attacks ripe fruits. The larva feeds inside the fruit, causing fruit softening and rotting. Fungal and bacterial agents could be seen later on infected portions of fruits.

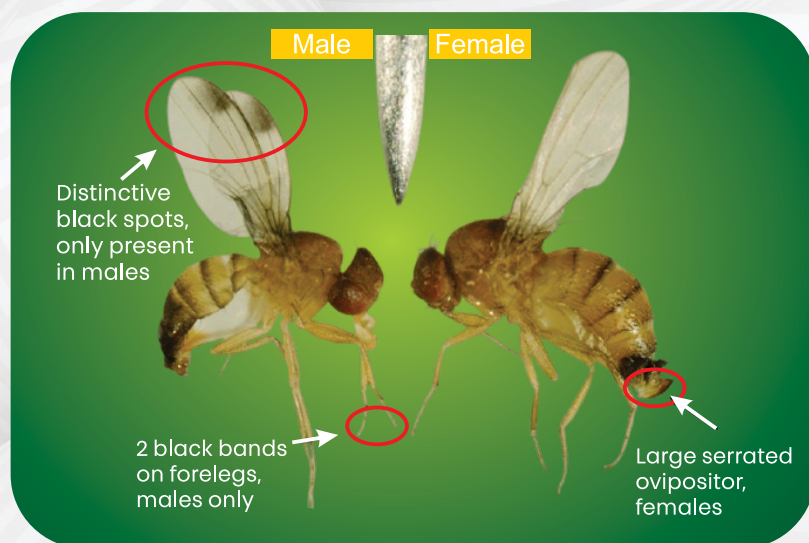


*D. suzukii*

Larvae

### HOST LIST :

Apples, Pear, Blueberry,  
Strawberry, Cherry berry, Raspberry  
Blackberry, Peach, Plum, Apricot, Citrus



**IF YOU SUSPECT THIS SPOTTED WING  
DROSOPHILA SWD PLEASE REPORT TO:**

**The Head - Plant Quarantine Services Institute**

Research Services Department

Research, Education and Specialist Services Directorate.

Ministry of Lands, Agriculture, Fisheries, Water and Rural Development

33km peg Hre - Bindura Highway P. Bag 2007, Mazowe, Zimbabwe.

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**MINISTRY OF LANDS, AGRICULTURE, FISHERIES,  
WATER AND RURAL DEVELOPMENT**

**AGRICULTURAL RESEARCH, INNOVATION AND  
DEVELOPMENT DIRECTORATE**



# RHIZOBIUM INOCULANTS

## THE BIOFERTILIZER OF YOUR CHOICE IN THE 2025-2026 LEGUME CROPPING SEASON

### Soyabean inoculant

- One 100g sachet is inoculated on 100kg soyabean seed that covers 1Ha.
- One sachet costs US\$5.00 in cash or prevailing bank rate RTGS\$ equivalent.
- No need for any chemical nitrogen fertilizers such as Ammonium Nitrate or Urea.
- Only basal fertilizer required.
- Cost of nitrogen fertilizer use per hectare reduced from US\$250 to US\$5.



### Sugarbean inoculant

- Four 100g sachets are required for 100kg sugarbean seed that covers 1Ha.
- One sachet costs US\$12.00 in cash or prevailing bank rate ZWG equivalent.
- Cost of nitrogen fertilizer use per hectare reduced from US\$250 to US\$20.



### Groundnuts inoculant

- Two 100g sachets are required for 100kg groundnut seed that covers 1Ha.
- One sachet costs US\$12.00 in cash or prevailing bank rate ZWG equivalent.
- Cost of nitrogen fertilizer use per hectare reduced from US\$250 to US\$10.



**Other inoculants:** Also available are inoculants for cowpeas, peas and pasture legumes (lucerne, lablab, sunnhemp, velvet beans).





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**PEST  
ALERT**

**Goss's wilt caused by *Clavibacter michiganensis subsp. nebraskensis* :  
Threat to maize production!**

**WHAT IS GOSS'S WILT**

Goss's wilt is a bacterial disease of maize caused by gram positive bacteria, *Clavibacter michiganensis subsp. nebraskensis*. This disease can cause both foliar symptoms and systemic wilt of maize plants, as well as severe leaf blighting. The leaf blight phase is generally more prevalent and more damaging.

**DISEASE DEVELOPMENT**

The pathogen spreads through planting infected seeds (although at a minuscule level of 0,05%), crop residues, soil, and secondary host plants in the Poaceae family. Wind-driven rain, irrigation, and contaminated equipment further facilitate transmission. Once on the plant, bacteria invade plant tissue through wounds caused by hail, pests, or mechanical damage. Though seeds have a low probability of transmission, they can still introduce the disease into new areas.

Plants may be infected at any stage of development. Wet weather and high relative humidity favor development of Goss's wilt. This is because wetness is required for infection to occur, and the bacteria spread most readily in humid weather. However, disease thrives in hot, humid conditions and spreads through plant stress or physical damage.

**SYMPTOMS**

Symptoms include irregular, water-soaked lesions on leaves that turn yellow, tan, or brown with dark borders. It can also cause malformed ears and tassels. Cutting the stalk reveals internal brown or reddish streaks in the vascular tissue, and bacterial slimy and smelly exudate may ooze from the cut, especially under pressure. The lesions may develop small, glossy droplets of dried bacteria ooze when exposed to sunlight. When dried, this ooze may look similar to dried varnish., the systemic wilt phase is less common and is often first observed in the early vegetative stages of growth (corn growth stages V2–V6). When the wilt phase develops, the infection may discolour xylem tissues or cause a slimy stalk rot, which is followed by wilting and plant death. Systemically infected plants may wilt and appear drought stressed. Maize plants may have weak stalks and an increased susceptibility to lodging.

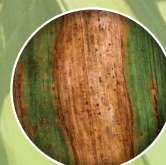
**THE MAIN DISEASES THAT ARE  
OFTEN CONFUSED  
WITH GOSS'S WILT**



**Northern Corn Leaf Blight** (*Exserohilum turcicum*) presents with very similar wavy cigar-shaped lesions, but they produce spores in the lesion, giving them a fluffy appearance.



**Grey Leaf Spot** (*Cercospora zeina*) Produces smaller rectangular lesions that never cross the veins



**Diplodia Leaf Streak** (*Stenocarpella macrospora*) Produces wavy lesions with runners. Against backlight, these lesions always have a yellow margin.



**Bacterial Leaf Streak** (*Xanthomonas campestris pv. zeae*) forms smaller bacterial streaks within the veins.



**Sunburn/Heat and Water Stress** is most often confused with the disease as it is also present in dry warm areas and causes similar wavy dry lesions on the plant, eventually destroying the foliage and causing premature death. The absence of any disease-causing organism (bacterial freckles) or a laboratory test will confirm this.



**Red Spider Mite Damage** causes drying of the leaves with veins being sucked dry by the spider mites. The presence of small moving red mites visible with the naked eye confirms this symptom.

**INITIAL LESIONS:**

- **Shape:** Oblong or elongated lesions
- **Color:** Water-soaked, greyish-green tissue
- **Progression:** Lesions turn into long, dead streaks



**LESION EXTENSION:**

- Along leaf veins, often crossing over veins
- Wide lesions: Larger than typical bacterial lesions

**COALESCENCE OF LESIONS:**

- Lesions merge under severe infection
- Premature leaf death and significant photosynthetic area loss

**CONSEQUENCES OF LOSS OF LEAF AREA:**

- Reduced plant vigour
- Stalk rot, lodging (loss of stalk integrity)
- Ear moulds, roted-back ears, rubbery cobs
- Yield loss (reduced test weights, malformed ears)

**LESION MARGINS:**

- Water-soaked edges
- Dark green or black freckles (water-soaked, irregular spots near lesion edges)



**EXUDATE:**

- Sticky, shiny bacterial ooze at the lesion site
- Glistening residue or varnish when exudate dries



**SYSTEMIC WILT:**

- Infected plants show stunting, wilting, and premature death (similar to drought stress)
- Seedlings and early V-stage plants are most susceptible to systemic infection, often from hail damage or sandblasting



**If you notice any of the above mentioned symptoms on maize plants, please contact :**  
**Research, Education and Specialist Services Directorate**  
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Plant Quarantine Services Institute,  
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# HYDROPONIC FODDER FACT SHEET

## Hydroponic Fodder

Hydroponic fodder is young tender grass grown from cereal in water under a controlled environment without use of soil. Mostly used cereals for hydroponic fodder are barley, corn, oats, wheat, sorghum, or legumes, such as alfalfa, clover, or cow peas. Hydroponic fodder production systems help to overcome the challenges on fodder availability due to climate change. The use of smart farming technologies has enabled production of animal fodder hydroponically in a record 7-9 days.

## Propagation

### Environmental factors

The desirable humidity is 12% and the seed should be viable for maximum germination. Temperatures should be maintained at 21°C, and it should be as constant as possible to ensure higher growth and the best nutritional value possible.

### Seed selection

Selected seed of cereals or legumes for hydroponic fodder should be free from diseases to avoid transmission. One should select seeds that are not exposed to insecticide or fungicide. Seed is soaked in normal clean water, with the purpose of eliminating the whole material that floats, then drained and soaked in water with 2% sodium hypochlorite for 15 minutes. After this soaking, the seed is drained again, given a quick washing and sent to the pre-germination area for 4-24 hours depending on the type of seeds. Seeds are then put in sacks for them to sprout.

### Sowing

The process of sowing the seed in trays is done very carefully to avoid damage to the grain. The sprouted seed should already have four roots. Trays sizes of 45cm x 45cm x 5cm can be used and can give 5-7kg fodder. A typical 6mx10mx3m greenhouse may hold about 1800 trays stacked on shelves that hold the grain used to grow fodder. The trays are tilted to slant on one end and have holes in one side to drain excess water. The trays are under controlled environmental conditions in a typical 6-9-day cycle and the fodder will be 25cm-30cm long by then.

### Expected Yield

Commercial hydroponic fodder companies report that about 5-7 kg of fresh fodder could be produced from 1kg grain. The said fodder can be used to supplement feed for head of cattle, goats/sheep, pigs and chickens.

### Advantages of hydroponic fodder production system

- Requires little land
- Little amount of water is required
- Rapid, year- round production
- Highly palatable and nutritious
- Increased new born survival rates
- Reduced labor requirement
- Increased digestibility of nutrients
- Increased stocking capacity
- Requires very short production cycle
- Reduces cost of feed
- Improved livestock performance
- Low-cost structure

### Benefits of hydroponically grown fodder

- Contains all chemical groups of feed in the right proportion and form
- Contains enzymes and hormones
- Stimulates the immune response
- Reduction in anti-nutritional factors
- Anti-oxidant properties
- Up to 25% increase in milk yield
- Reduced incidence of acidosis when fed to finishing cattle
- Reduced respiratory conditions since hydroponic fodder is dust free
- Less metabolic disorders
- Disease free
- Uses 90% less water than field fodder

**Note:** Hydroponically grown fodder should be supplemented with dry matter. Cows should be provided with clean water at all times.

## Nutrient Content

### Protein

21% CP wheat versus 15% in grain  
2.51%CP Maize  
4%CP Oats  
12%CP Barley

### Carbohydrates

71% wheat  
72% maize

### DM

12-15% in hydroponic fodder  
300kg cow needs 3% of  
300kg=9kg  
One grown up dairy cow of  
300kg live weight needs 9kg/day.