



TECHNICAL INFORMATION BULLETIN—APPLES

OVERVIEW

Excalia™ Fungicide is a 2.84 SC foliar formulation of the active ingredient INDIFLIN™ (inpyrfluxam). *Excalia* is intended for use on apple scab, powdery mildew and rust diseases. *Excalia* works quickly to form a complete zone of protection on the leaves for powerful disease protection.



EXCALIA TECHNICAL FEATURES—APPLES

- ▶ Superior locally systemic action for complete leaf tissue uptake and distribution across the leaf surface
- ▶ Highly translaminar for fast movement to the opposite side of the leaf for protection of both sides
- ▶ Excellent control of apple scab—even post infection
- ▶ Attacks the scab pathogen at two key points in its life cycle: spore germination and mycelial growth

TARGET DISEASES AND RATES/INSTRUCTIONS FOR EXCALIA—APPLES

Crop	Target Diseases	Excalia Use Rate	
		fl oz/A	lb AI/A
Apples	Apple Scab <i>(Venturia inaequalis)</i> Powdery Mildew <i>(Podosphaera leucotricha)</i> Cedar-Apple Rust <i>(Gymnosporangium juniperi-virginianae)</i> Quince Rust <i>(Gymnosporangium clavipes)</i>	3–4	0.067–0.089

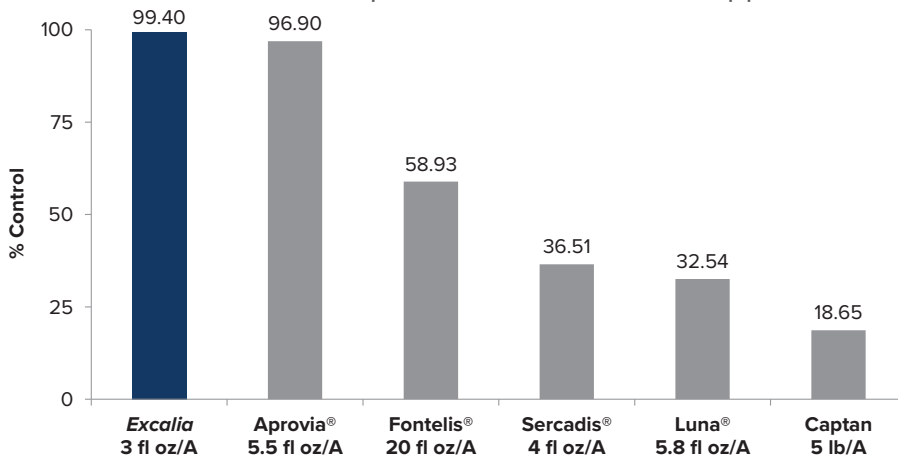
Make applications between green tip and petal fall. Do not apply earlier than green tip. Do not make more than 2 applications per year. Retreatment interval: 10 days. PHI: Do not apply after petal fall. For powdery mildew, application must include an adjuvant at the recommended dose. Do not apply with crop oil concentrate.

MODE OF ACTION

INDIFLIN, the active ingredient in *Excalia*, acts as a mitochondrial respiration inhibitor and disrupts the energy cycle in fungi by targeting succinate dehydrogenase (complex II). It interferes with spore germination, mycelial growth and spore production. As a foliar application, *INDIFLIN* has good rainfastness and exhibits translaminar activity, meaning that treatment of the upper (adaxial) surface of a leaf provides protection of the lower (abaxial) surface and vice versa. *INDIFLIN* is not phloem-mobile and therefore does not move out of a treated leaf to those above and below. *INDIFLIN* belongs to the succinate dehydrogenase inhibitor (SDHI) class (Group 7) of fungicides as classified by the Fungicide Resistance Action Committee (FRAC). Resistance status: Medium-high risk.

POST-INFECTION APPLE SCAB ACTIVITY

Excalia delivers excellent post-infection control of apple scab.



In greenhouse testing, *Excalia*, applied four days after infection, provided excellent control of apple scab on the leaves.

Untreated scab severity was 84%.

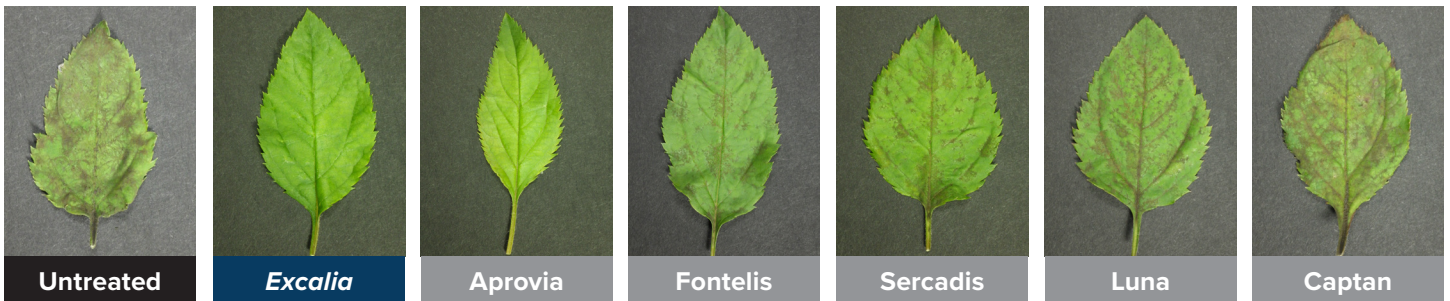
Application volume: 53 gal/A

Application: Aug. 10

Inoculation: Aug. 6

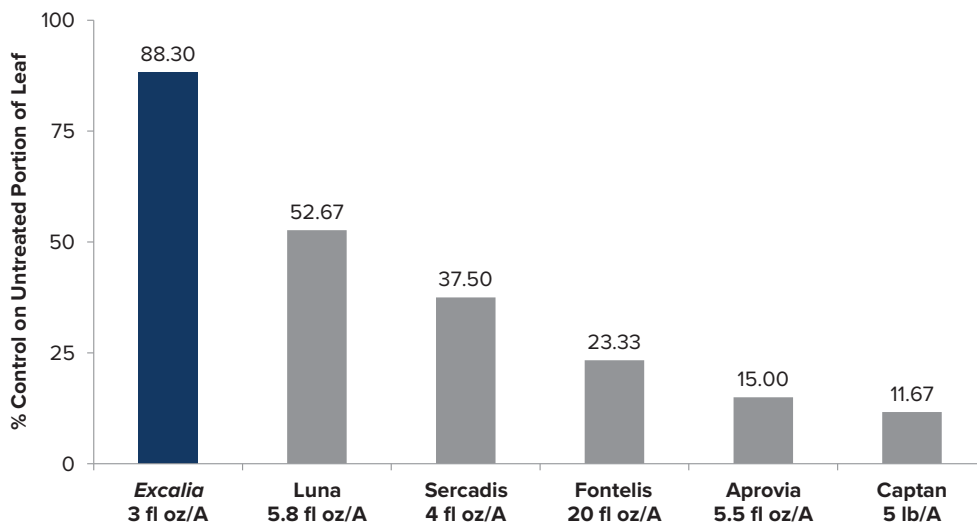
Assessment: Aug. 22

Source: Sumitomo Chemical Co.



SYSTEMIC ACTIVITY

Excalia provides superior systemic action for complete leaf tissue uptake and distribution across the leaf surface.



In greenhouse testing, when applied to the leaf petiole, *Excalia* exhibited superior control of apple scab through the untreated leaf portion.

Untreated scab severity was 100%.

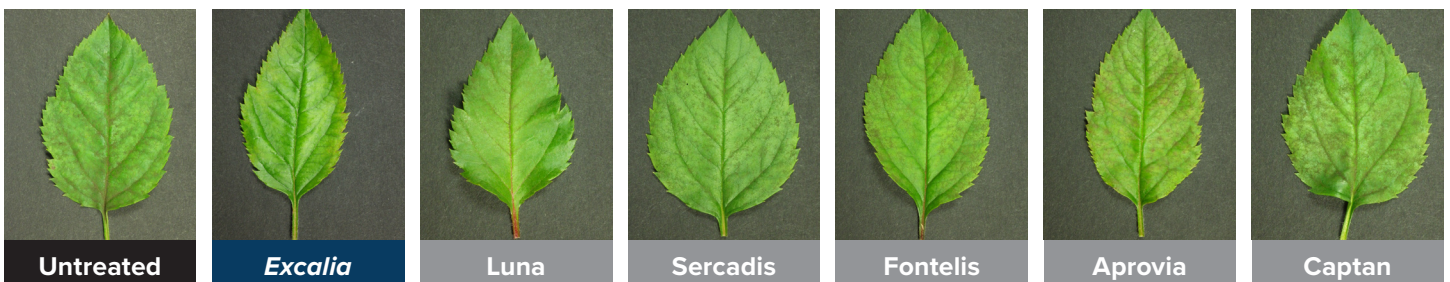
Application volume: 2 ul/petiole

Application: Oct. 4

Inoculation: Oct. 9

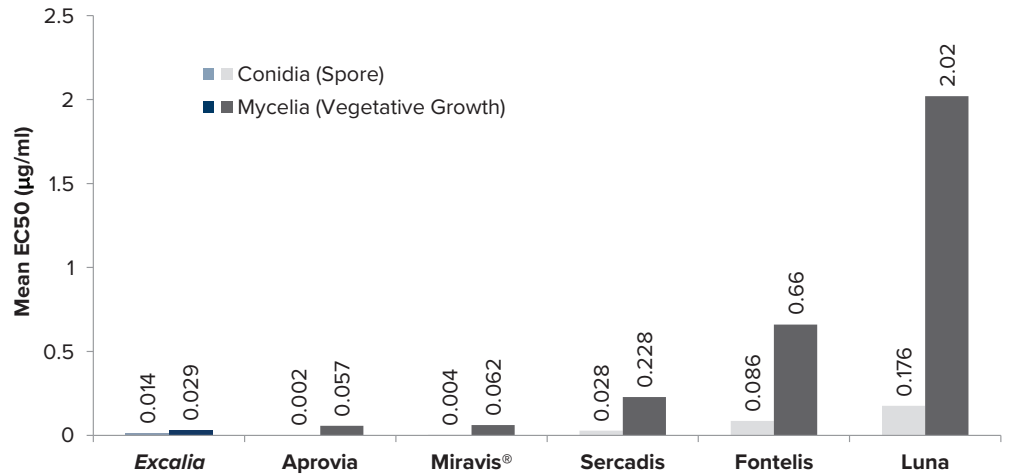
Assessment: Oct. 23

Source: Sumitomo Chemical Co.



INHERENT ACTIVITY AGAINST APPLE SCAB (*VENTURIA INAEQUALIS*)

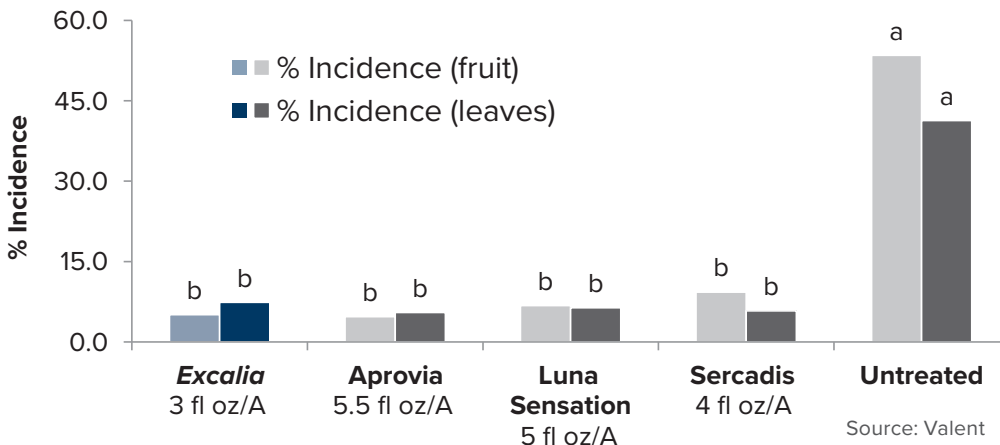
Excalia is highly active against the apple scab pathogen. Laboratory tests show that *Excalia* inhibits growth of conidia (spore) germination and mycelia (vegetative growth) of the scab pathogen at doses as low as 0.014 ppm and 0.029 ppm, respectively. No other SDHI fungicide in the test provided the same level of mycelia inhibition at doses as low as *Excalia*.



Source: Sumitomo Chemical Co.

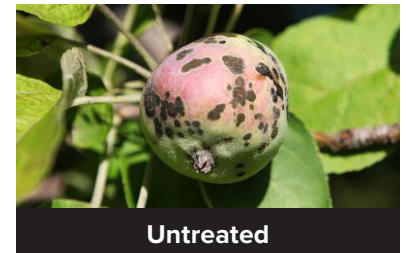
EXCALIA EFFICACY AGAINST APPLE SCAB AND POWDERY MILDEW

In multiple field trials, *Excalia* provided excellent control of apple scab.

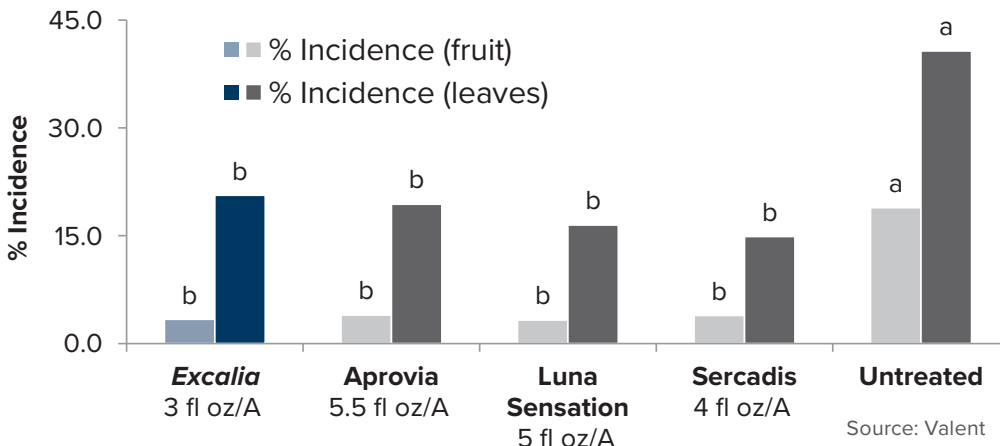


Source: Valent

All fungicides applied at pink and petal fall, followed by 8 protectant cover sprays. Treatments tank mixed with organosilicone adjuvant at 0.06% v/v. Means followed by the same letters are not significantly different ($P < 0.01$).



In multiple field trials, *Excalia* provided excellent control of powdery mildew.



Source: Valent

All fungicides applied at pink and petal fall, followed by 8 protectant cover sprays. Treatments tank mixed with organosilicone adjuvant at 0.06% v/v. Means followed by the same letters are not significantly different ($P < 0.01$).



RESISTANCE MANAGEMENT GUIDELINES

For resistance management, do not tank mix with other FRAC 7 fungicides.

IDENTITY, PHYSICAL AND CHEMICAL PROPERTIES

The information contained herein is, to our knowledge, true and accurate as of the published date of this bulletin. Valent U.S.A. LLC continues to gather additional information as to the efficacy, toxicology, protective procedures and equipment, etc., and the forgoing is inherently interim and incomplete.

Common name: inpyrfluxam (ISO)

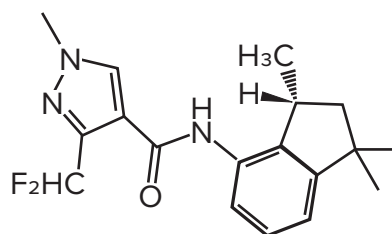
Chemical name: 3-(difluoromethyl)-*N*-[*(R)*-2,3-dihydro-1,1,3-trimethyl-1*H*-inden-4-yl]-1-methyl-1*H*-pyrazole-4-carboxamide

Group name: Succinate dehydrogenase inhibitor (SDHI)

Chemical group: pyrazole-4-carboxamide

FRAC Code: 7

Chemical structure:



TOXICITY

For Formulated Product:

Acute oral LD₅₀ (rat): 550 mg/kg (EPA Tox Category III)

Acute dermal LD₅₀ (rat): >5,000 mg/kg (Tox Category IV)

Acute inhalation LC₅₀ (rat): >2.10 mg/L (4 hr) (Tox Cat IV)

Eye irritation: Non-irritating (Tox Category IV)

Skin irritation: Non-irritating (Tox Category IV)

Skin sensitization: Non-sensitizer



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