



FAQ for Fracture® Fungicide Updated March 15, 2018

What is Fracture® fungicide?

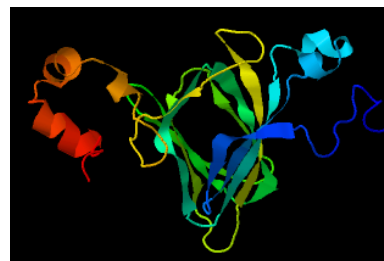
Fracture fungicide is a fungicide primarily targeted for use in tree, vine, fruit and vegetable crops to treat a broad range of diseases affecting these high-value segments.

- The active ingredient is called **BLAD (*Banda de Lupinus albus doce*)**, which is a novel active ingredient, a polypeptide discovered in lupine plants. BLAD has an excellent mammalian and environmental toxicological profile.

What is the mode of action (MOA) or class of chemistry?

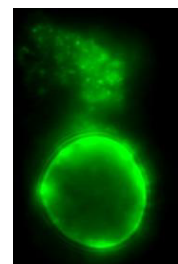
BLAD, the active ingredient in Fracture fungicide, is a new multi-site active ingredient with its own biological mode of action FRAC Group, BM01. In fungal plant pathogens, BLAD binds very strongly to chitin, disrupting chitin synthesis while it prevents nutrient uptake and cellular division. Being a multi-site fungicide agent makes BLAD a valuable resistance management tool.

- The BLAD polypeptide structure (right) is the unique and driving force behind Fracture fungicide's performance. This is a multi-site mechanism with a very low probability of resistance developing over time.
- This MOA is an excellent fit into current, standard fungicide programs as an effective, resistance management tool for use in IPM programs. Fracture fungicide stands apart from existing products as a truly novel MOA (BM01).



How BLAD kills fungal cells

- In fungal pathogens, BLAD coats the cell wall, deforming the chitin structures and tearing open the cell wall, allowing the BLAD polypeptide to come in contact with the cell membrane.
- BLAD then coats the cell membrane by binding to its sugars and zinc. This prevents the fungal cell from absorbing nutrients.
- Within an hour of exposure, BLAD has covered the fungal cell's membrane, causing a cascade of negative effects on its nutrient transport, metabolism, cell wall synthesis and cell division systems.
- Within four hours of exposure to BLAD, the cell cannot reproduce.
- Within eight hours of exposure to BLAD, the fungal cell is dead.



Fungal cell membrane enveloped by BLAD.

In short: BLAD envelops the fungal cell wall.

1. Binds to the cell wall, covering the fungal pathogen entirely
2. Ruptures the cell wall physically and cracks the surface
3. Coats cell membrane, covering it entirely
4. Suffocates the cell



FAQs for Fracture® Fungicide

What diseases does Fracture® fungicide control?

Fracture fungicide has shown activity on several fungal and bacterial diseases. (See commercial label for complete listing of approved crops and diseases.) Grape diseases controlled are *Botrytis* bunch rot and powdery mildew. Fracture fungicide has shown excellent activity on bacterial diseases such as sour and ripe rots on grapes (See 2ee labels for expanded disease listings). In tomatoes, excellent *Botrytis* and powdery mildew control has been observed. Recent studies in processing tomatoes have shown excellent early blight control and suppression of bacterial diseases. Field testing has shown excellent performance on key diseases such as powdery mildew and brown rot blossom blight.

What type of formulation is Fracture fungicide?

Fracture fungicide is a 2.1 lbs. ai per gallon liquid SC formulation, brown in color.

What is the recommended use rate?

Use rate can vary by disease and crop, but will range from 20.5 oz. to 36.6 oz. per acre. Performance data indicates that 0.3 lbs. ai/A, or 20.5 fl. oz., provides control equivalent to conventional standards. In California, FMC has a 2ee in grapes for rates of 18.3-20.4 fl. oz./A to control powdery mildew.

Is Fracture fungicide preventative or curative?

Fracture fungicide is a preventative with limited curative activity. For optimal performance, Fracture fungicide should be used early in the rotation program prior to onset of disease.

What is the target price per acre?

Price and programs are available from your retailer.

What is the packaging size for Fracture fungicide?

Fracture fungicide is sold in 4x1 gallon cases. At 20.5 fl. oz. use rate, each gallon container treats approximately six acres.

What crops are registered for use on the Fracture fungicide label?

Fracture fungicide is labeled for use on grapes, almonds, strawberries and tomatoes.

What is the toxicological profile of Fracture fungicide?

Fracture fungicide has extremely low toxicity to non-target organisms, and the risk to the environment is extremely low. The label has a pre-harvest interval (PHI) of one day and a re-entry interval (REI) of four hours making it an excellent fit in IPM programs.

Will the needed Fracture fungicide MRLs be in place for our customers' trading partners?

The BLAD polypeptide active ingredient is registered in the US and Canada and in both countries there is an exemption from the requirement of establishing tolerances (i.e., no MRLs needed). CEV has gained regulatory approval for BLAD on certain crops in South Korea, China, and Australia and there is also an exemption from the requirement to establish MRLs. BLAD is pending approval in Europe with an expected decision in late 2018 or early 2019. It is anticipated that no MRLs will be required in Europe. Plans are also in place to register BLAD in Japan and Mexico.

Always read and follow all label directions, precautions and restrictions for use. Some products may not be registered for sale or use in all states. FMC and Fracture are trademarks of FMC Corporation or an affiliate. ©2018 FMC Corporation. All rights reserved. 18-FMC-0585 03/18



FAQs for Fracture® Fungicide

Is Fracture® fungicide a biological?

Yes, Fracture fungicide has been classified as a biological fungicide by the USEPA. The active ingredient in Fracture fungicide occurs exclusively in the lupine plant, acting as a naturally occurring fungicide. Fracture fungicide has been classified, submitted and accepted into the EPA registration review process as a biological pesticide.

Is Fracture fungicide compatible with other pesticides or nutritional?

Fracture fungicide can be mixed with foliar fertilizers, though not all mixtures have been tested. Consult the label for specific directions on mixing Fracture fungicide with foliar fertilizers.

What are the benefits of Fracture fungicide to growers?

Fracture fungicide offers:

- A novel MOA that will be an effective disease management tool to be implemented into IPM strategies
- Strong resistance management tool
- One-day PHI
- Four-hour REI
- Broad-spectrum disease control
- Can be applied up to five times per season from the beginning of the crop up to one day before harvest
- Excellent mammalian and environmental toxicological profiles
- Exempt from the requirement to establish tolerances/MRLs in the U.S. and Canada

Is Fracture fungicide a single chemistry or a pre-mix?

Fracture fungicide contains a single active ingredient with multi-site activity.

Who should I contact if I have questions?

Person	Role	Contact Information
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