

1:20 *Bacillus pumilus* isolate QST 2808

Biological fungicide (bacterium)

Bacterium: Bacillales: Bacillaceae

NOMENCLATURE: **Approved name:** *Bacillus pumilus* Meyer and Gottheil isolate QST 2808.

Development code: OPP **Chemical Code:** 006485.

SOURCE: The bacterium, *Bacillus pumilus* isolate QST 2808, is prevalent in soils and has been found in a variety of habitats world-wide. The isolate selected for commercialisation was chosen because of its spectrum and level of activity against important economic fungal and bacterial pathogens.

PRODUCTION: *Bacillus pumilus* is produced commercially by fermentation. The fermentation medium with viable spores is used to prepare the product.

TARGET PESTS: For use against a wide range of plant fungal diseases, including powdery and downy mildews and rusts.

TARGET CROPS: ‘Sonata’ is targeted for use in small-grain cereals, tree fruit, vegetables and vines.

BIOLOGICAL ACTIVITY: Mode of action: *Bacillus pumilus* isolate QST 2808 employs a novel mode of action that inhibits fungal pathogen development on the leaf surface and also activates the plant’s immune system. Initial research has shown that ‘Sonata’ may have curative activity as well as preventive properties, thereby arresting the development of powdery and downy mildews, rusts and other pathogens.

COMMERCIALISATION: Formulation: ‘Sonata’ is based on a proprietary isolate of the bacterium *Bacillus pumilus* isolate QST 2808 and is formulated as an aqueous suspension (AS) and a wettable powder (WP). **Tradenames:** ‘Sonata’ (AgraQuest).

APPLICATION: ‘Sonata’ is applied as a foliar fungicide. The WP formulation is applied at a rate of 5 to 8 kg per hectare and the AS formulation is applied at rates of 4 to 6 litres per hectare. It should be applied in sufficient volume for complete foliar coverage. *Bacillus pumilus* isolate QST 2808 occurs naturally in the environment and will complement growers’ Integrated Crop Management (ICM) programmes. With an expected zero-day post-harvest interval, ‘Sonata’ may be applied up to and including the day of harvest.

PRODUCT SPECIFICATIONS: Specifications: *Bacillus pumilus* is produced commercially by fermentation. The fermentation medium with viable spores is used to prepare the product.

Purity: The WP formulation consists of 5×10^9 cfu/g and the AS formulation consists of 7×10^9 cfu/ml. Guaranteed to be free of microbial contaminants. **Storage conditions:** Both the

WP and AS formulations should be stored under dry, ambient conditions.

Shelf-life: Preliminary indications are that ‘Sonata’ is stable for at least 2 years under the above storage conditions.

COMPATIBILITY: Compatible with many fungicides, bactericides, insecticides, foliar nutrients and adjuvants used in the control of crop diseases. In ICM strategies, it is unusual to apply ‘Sonata’ with chemical pesticides. Incompatible with strong oxidisers, acids, bases and chlorinated water.

MAMMALIAN TOXICITY: ‘Sonata’ is considered to be a non-toxic product when used according to label directions. It meets all the criteria for US-EPA Toxicity Category III with the signal word ‘Caution’.

ENVIRONMENTAL IMPACT AND NON-TARGET TOXICITY: *Bacillus pumilus* isolate QST 2808 is not harmful to non-target organisms or to the environment. Tests were conducted to help ensure that there were no risks to plants, insects or birds. Aquatic exposure is not expected. Tests have shown that this bacterium does not harm seeds or cause them to decay.

Approved for use in organic farming: Yes.