



PENBOTEC® 400SC

The best to protect your fruit



JANSSEN PMP

PRESERVATION AND MATERIAL PROTECTION
a division of Janssen Pharmaceutica NV



The Product

PENBOTEC® 400SC contains the reduced risk active ingredient pyrimethanil. It has a proven track record in the market as a premium postharvest treatment for the control of a broad spectrum of postharvest diseases. The product offers superior preventative and curative decay control activity.

The product is formulated as a Suspension Concentrate (SC) containing 400 g/l pyrimethanil.

Registered Uses

PENBOTEC® 400SC can be used in dip and wash tanks, drenchers, aqueous line spray and in wax line spray systems. A thorough coverage of the fruit surface is important to achieve sufficient distribution and level of residues for optimal product performance, especially for long-term storage and extended shelf-life in transport and retail. Contact your local service company provider to optimize your treatment system parameters and for routine residue level monitoring.

	Rate (fl. Oz. / 100 gal)	Treatment time (minutes)	Concentration (ppm)
Dip, wash tanks	16-32	1	500-1000
Drencher	16-32	1	500-1000
Aqueous line spray	32	1	1000
Wax line spray	64	1	2000

The Spectrum of Activity

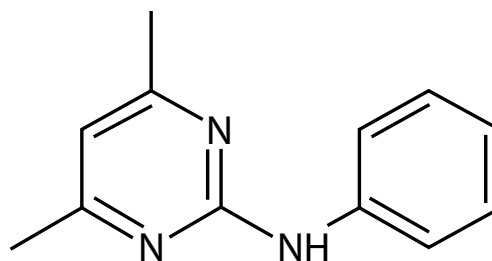
	Blue mold <i>Penicillium expansum</i>	Grey mold <i>Botrytis cinerea</i>	Bull's eye rot <i>Neofabraeae spp.</i>	Systemic activity	Long lasting activity
PENBOTEC® 400SC	++(+)	+++	+++	+++	+++
FLUDIOXONIL	++	++	+	++	++
THIABENDAZOLE	++(S)	++(+)	++	0	0

+++ excellent, ++ good, + moderate, 0 none, S = sensitive strains

Use Recommendations

- For optimal use of the product, it should be applied as soon as reasonably possible after harvest but surely within 24 hours, to be able to protect harvest wounds.
- Residues are influenced by several factors including treatment time and the pH and temperature of the treating solution.
- PENBOTEC® 400SC has a broad spectrum of activity including nearly all economically significant disease organisms. Combinations but more likely alternation with other fungicides, with different modes of action, should be considered for protection against the development of resistance.
- The product is not compatible with all disinfectants and compatibility is dependant on the concentration of the disinfectant.

For further information,
contact your local service company or
a representative of Janssen PMP.



The Mode of Action

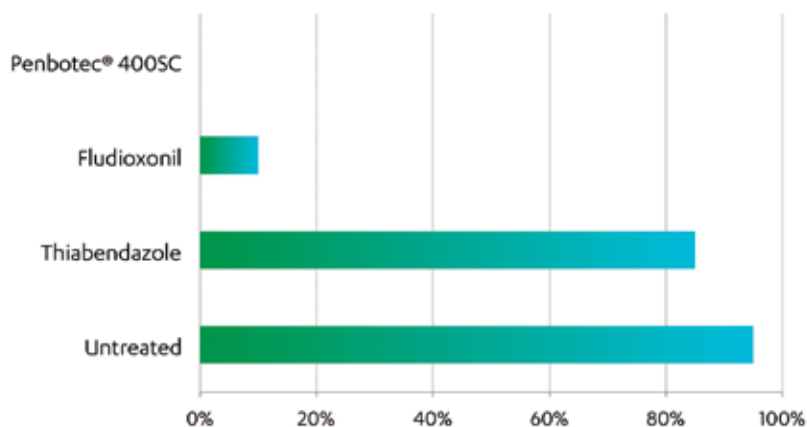
The biochemical mode of action of PENBOTEC® 400SC is the inhibition of fungal secretion of cell wall degradation enzymes like proteinases, cellulases, pectinases and lactase. Moreover, the active ingredient inhibits the biosynthesis of methionine reflected by a reduced spore germination, an inhibition of germ tube elongation and the prevention of lesion expansion. The latter is the result of the blockage of the lytic function of infection hyphae. **As a consequence, PENBOTEC® 400SC is a fungicide with preventative and curative activity.**



Efficacy of Penbotec® 400SC

As pome fruit is stored over long periods of time and is shipped to consumers throughout the world, a long lasting activity is essential for optimum postharvest decay protection. The results presented in the graphs below represent multiyear evidence of the long lasting efficacy of PENBOTEC® 400SC. The study was carried out on fruit which was infected with blue mold seven months after treatment. Even under these circumstances PENBOTEC® 400SC preserved the quality of the fruit.

Percentage of Blue Mold Infection after Long Term Storage



source: Xiao, C. L., and Boal, R. J. 2009. Residual activity of fludioxonil and pyrimethanil against *Penicillium expansum* on apple fruit. *Plant Dis.* 93:1003-1008

Because there are so few post harvest decay prevention tools available for the protection of pome fruit it is essential that proper management practices are utilized when using these products. Always apply the full labeled dose rate. Low residues and under dosing can hasten the development of resistance.

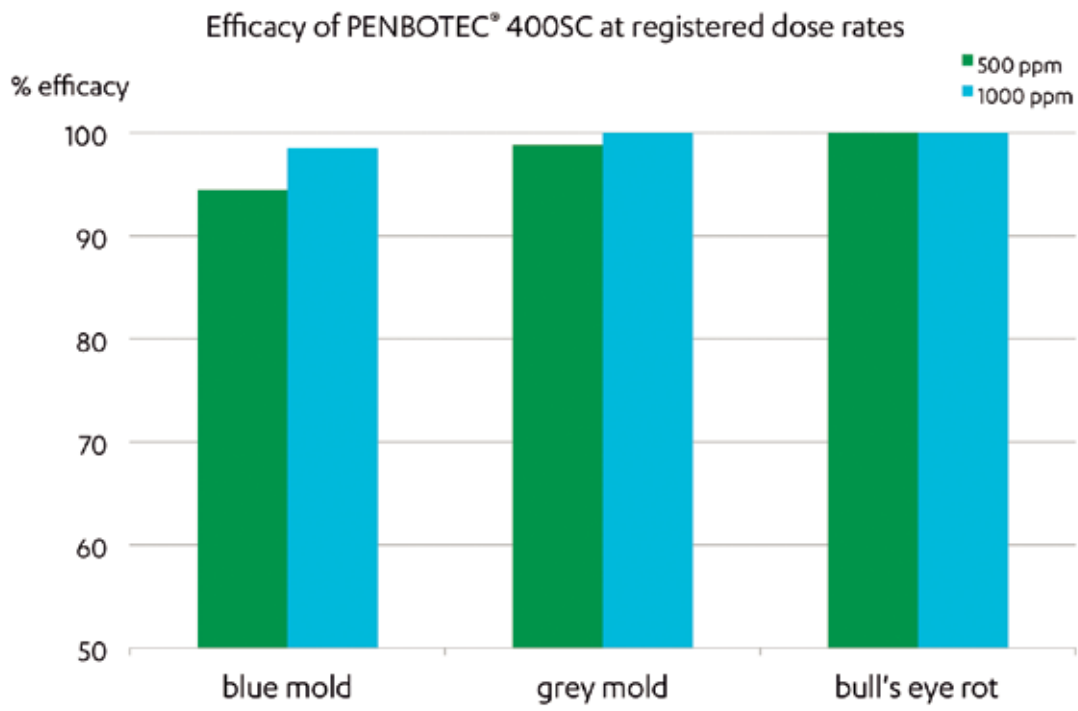
Don't put your fruit at risk - use PENBOTEC® 400SC for season long protection.



Global Environment

Maximum Residue Limits (MRLs) for pyrimethanil are established in most market destinations of the world. For more specific information and updates please contact your service company or the FAS online pesticide MRL database at <http://www.mrlatabase.com>.

Spectrum of Activity





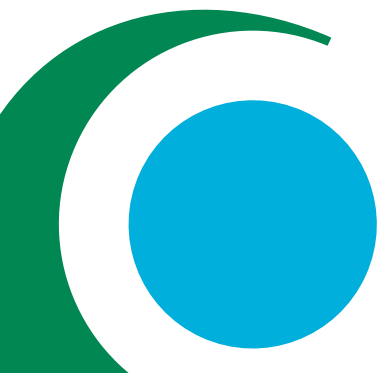
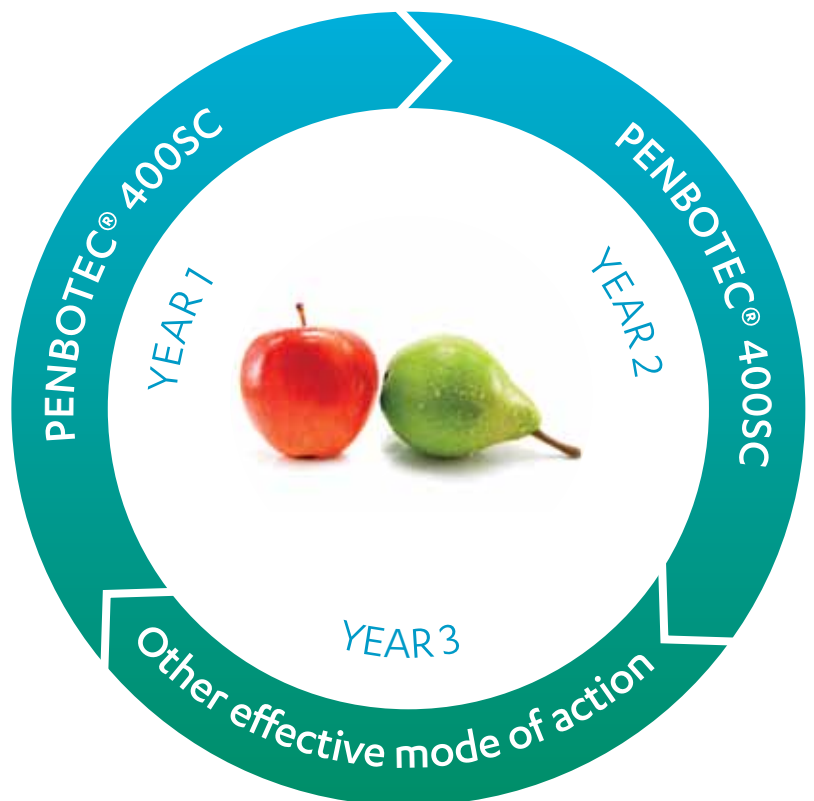
Anti-resistance strategy

To maintain the efficacy of PENBOTEC® 400SC it is not advisable to use the product repeatedly, season after season. Indiscriminate use would enhance the development of resistance to the molecule for one or more postharvest pathogens, resulting in reduced robustness and spectrum of diseases controlled and as a consequence the product, with all his strengths, would not be available for the market anymore.

Combining different active ingredients seems a logical approach to minimizing the risk of developing resistance, but if resistance to one of the combination components is already established, this could enhance development of resistance to the other combination component. Because there are only a limited number of products available for postharvest use, a combined exposure, either as a tank mix or dual product, should be avoided as this would increase the probability of developing multi-resistance to more than one active ingredient. Therefore, the preferred defense, to prevent the onset of resistance, is an appropriate alternation schedule of products with different mode of actions.

Studies have shown that an alternation scheme of 2 consecutive years of PENBOTEC® 400SC application followed by 1 year of an alternate product of another mode of action without cross resistance to PENBOTEC® 400SC will provide all the benefits of the product in the years of use without compromising the future activity by resistance development.

Using alternation products at lower than full dose rates could negate the benefit of the resistance management strategy.



Good Practices

Good practices also include sanitation, both in the orchard as in the packing house. Sanitation is the first line of defense in decay and fungicide resistance management. A poor sanitation program will undo the positive effects of all the fungicide management practices.

In the orchard

- Remove inoculum sources of orchard-related pathogens.
- Do not place bins on muddy orchard soil.

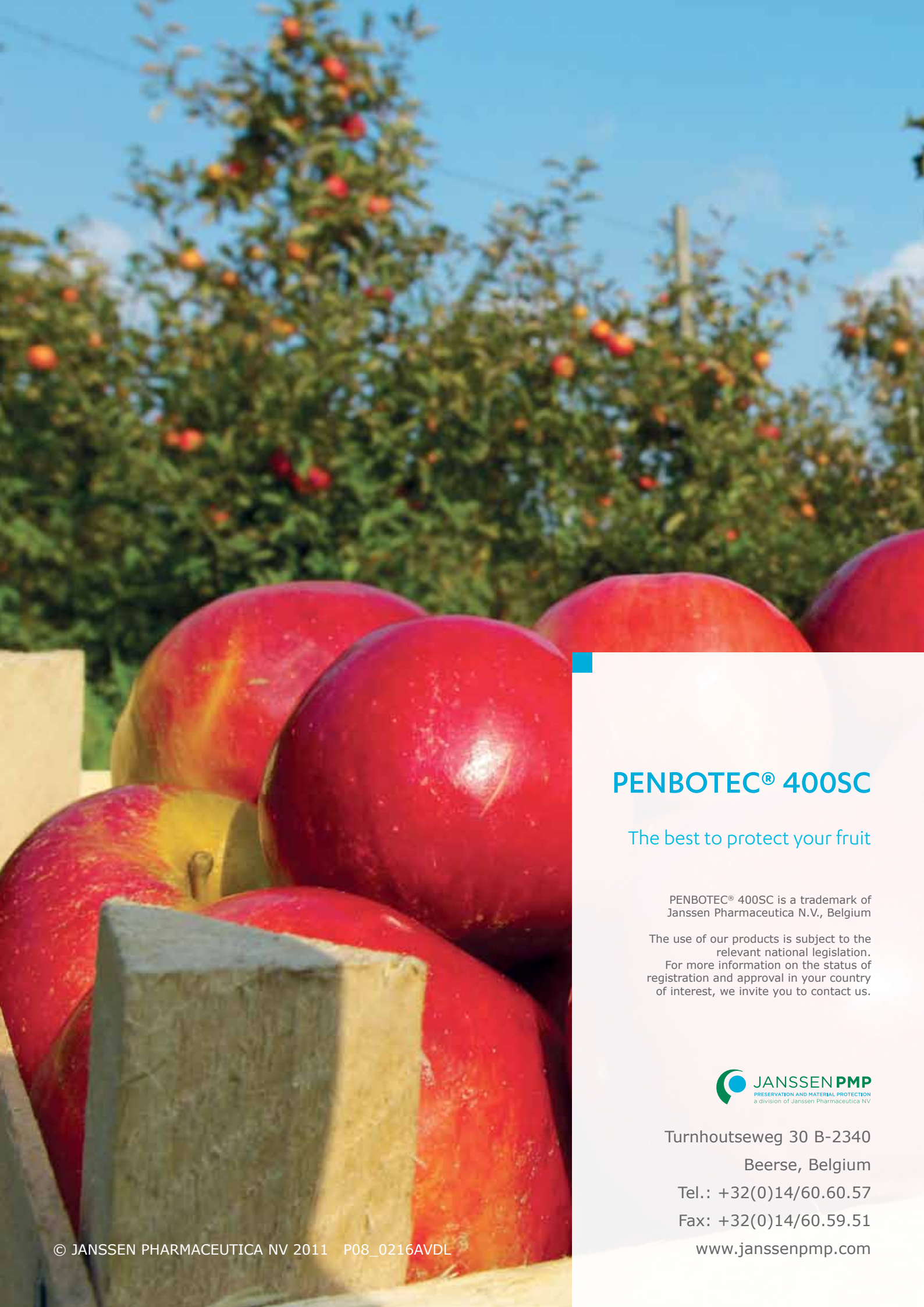
In the packinghouse

- Avoid build-up of inoculum in the drench water by adhering strictly to drench water change schedules.
- Sanitize water systems, packing lines, storage rooms, and bins.

Key use reasons for PENBOTEC® 400SC

- Excellent Return on Investment
- Superior efficacy against blue and gray mold decay
- Excellent activity against bull's eye rot
- Long term activity
- Curative and preventative effect
- Proven track record
- Essential tool for resistance management in the packing house
- Well established brand
- Widespread establishment of MRLs





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PENBOTEC® 400SC is a trademark of Janssen Pharmaceutica N.V., Belgium

The use of our products is subject to the relevant national legislation. For more information on the status of registration and approval in your country of interest, we invite you to contact us.



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