Xemium®

Leading Performance

Technical Information

BASF
The Chemical Company

Xemium®: Leading performance for growing success

Growers worldwide depend on safe and reliable tools for controlling diseases. Highly efficient, innovative fungicides are key for sustainably managing fungal diseases while also ensuring good quality and yields.

For many years, BASF has offered its customers a broad portfolio of dependable fungicides. A team of BASF researchers, who steadily put science to work for the benefit of agriculture, has now developed a new, powerful active ingredient belonging to the important chemical class of carboxamides: **Xemium**.

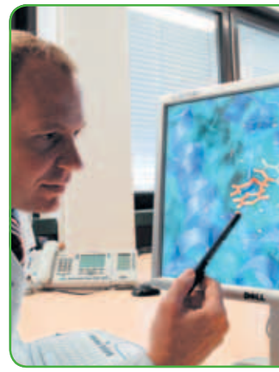
Xemium exhibits strong, long-lasting activity against a very wide spectrum of fungi, and its unique distribution properties within the plant result in pronounced preventative performance. This not only allows disease control in a broad range of crops but also helps to consistently achieve high yields with high quality.

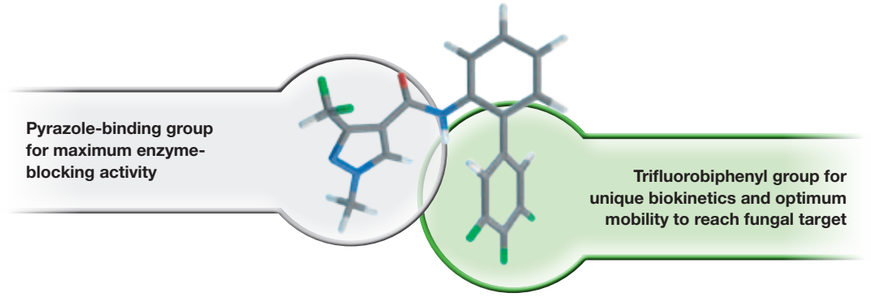
For growers, **Xemium**-containing products will become important partners for reliably driving agricultural and business success.

Xemium®: Tailor-made molecular structure

To control diseases efficiently, the active ingredient must reach its target in the fungi as quickly as possible. This presents a challenge to any chemistry for two main reasons: the target location lies deep in the interior of the fungal mitochondria but the cells of the fungus are surrounded by a firm exterior shell.

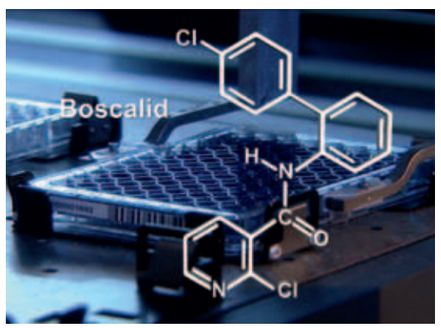
Xemium, an innovative fungicide, has an optimized molecular structure that allows it pass through membranes in both plants and fungi very quickly. By this, **Xemium** can reach and block the target in the fungi more quickly and efficiently than other comparable molecules.





Xemium: strong performance paired with highest mobility

BASF – leading competence in carboxamide chemistry



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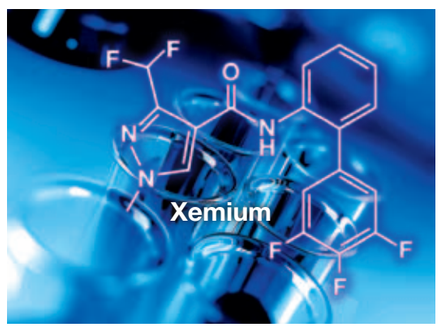
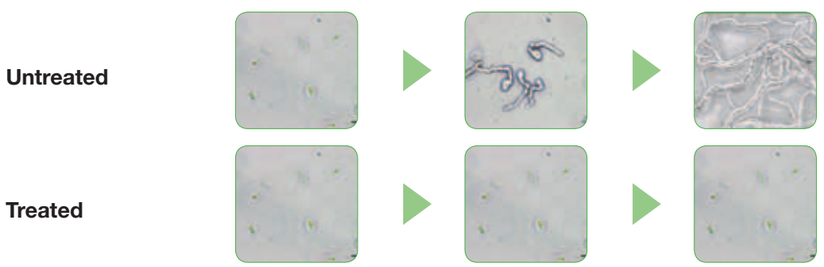


2011/12 – Xemium

High activity for strong preventative action



Xemium effectively inhibits spore germination and mycelium growth in developing fungi.

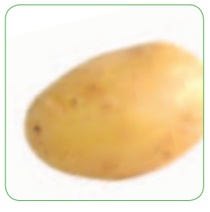
Xemium® Controls a wide range of fungi

Apples	Scab	*Venturia inaequalis*	• • • •
	Powdery mildew	*Podosphaera leucotricha*	• • • •
	Sooty blotch	*Diplocarpon mali*	• • • •
	Alternaria blotch	*Alternaria spp.*	• • • •
	Japanese rust	*Gymnosporangium yamadae*	• • •

Pears	Scab	*Venturia spp.*	• • • •
	Brown spot	*Stemphylium spp.*	• • • •
	Trellis rust	*Gymnosporangium* spp.	• • •
	Black spot	*Alternaria spp.*	• • • •

Stone fruits	Powdery mildew	*Sphaerotheca pannosa*	• • • •
	Brown rot	*Monilinia* spp.	• • • •

Grapes	Powdery mildew	*Erysiphe necator*	• • • •
	Grey mold	*Botrytis cinerea*	• • • •
	Black rot	*Guignardia bidwellii*	• • •
	Phomopsis	*Phomopsis viticola*	• •



Potatoes	Black scurf	*Rhizoctonia solani*	• • • •
	Early blight	*Alternaria solani*	• • • •

Tomatoes	Early blight	*Alternaria solani*	• • • •
	Powdery Mildew	*Oidium lycopersici*	• • • •

• • • • Excellent • • • Good

Beans	White mold	*Sclerotinia sclerotiorum*	• • •
	Angular leaf spot	*Isariopsis griseola*	• • • •
	Grey mold	*Botrytis cinerea*	• • • •

Peas	White mold	*Sclerotinia sclerotiorum*	• • •
	Leaf blight	*Mycosphaerella pinodes*	• • •
	Grey mold	*Botrytis cinerea*	• • • •
	Brown spot	*Ascochyta pisi*	• • • •

Lettuce	White mold	*Sclerotinia sclerotiorum*	• • • •
	Sclerotinia	*Sclerotinia minor*	• • • •
	Grey mold	*Botrytis cinerea*	• • • •

Squash	Powdery mildew	*Podosphaera xanthii*	• • • •
	Powdery mildew	*Golovinomyces cichoracearum*	• • • •

Bananas	Black sigatoka	*Mycosphaerella fijiensis*	• • • •

Carrots	Leaf blight	*Alternaria dauci*	• • • •
	Powdery mildew	*Erysiphe heraclei*	• • • •

The performance of **Xemium** depends on the dose rate used. Please refer to the local label recommendations.
Application of **Xemium** to further crops is under evaluation.

Xemium® Controls a wide range of fungi

Wheat	Speckled leaf blotch	*Septoria tritici*	• • • •
	Brown rust	*Puccinia triticina*	• • • •
	Powdery mildew	*Blumeria graminis*	• • •
	Eyespot	*Oculimacula* spp.	• • • •
	Stripe rust	*Puccinia striiformis*	• • •

Barley	Netblotch	*Pyrenophora teres*	• • • •
	Scald	*Rhynchosporium secalis*	• • • •
	Brown rust	*Puccinia hordeii*	• • • •
	Ramularia leaf spot	*Ramularia collo-cygni*	• • • •
	Spot blotch	*Cochliobolus sativus*	• • • •
	Sunburn injury		• • • •

Soybeans	Soybean rust	*Phakopsora pachyrhizi*	• • • •
	Powdery mildew	*Microsphaera diffusa*	• • • •
	Frogeye leaf spot	*Cercospora sojina*	• • • •
	Brown spot	*Septoria glycines*	• • • •
	Target spot	*Corynespora cassiicola*	• • • •

Corn	Grey leaf spot	*Cercospora zeae-maydis*	• • •
	Phaeosphaeria leaf spot	*Phaeosphaeria maydis*	• • • •
	Eye spot	*Kabatiella zeae*	• • • •

Oil rapeseed	Stem rot	*Sclerotinia sclerotiorum*	• • • •
	Black leg	*Leptosphaeria maculans*	• • •
	Grey leaf spot	*Alternaria brassicae*	• • • •

Sugar beets	Leaf spot	*Cercospora beticola*	• • •
	Powdery mildew	*Erysiphe betae*	• • • •

• • • • Excellent • • • Good

Mangos	Powdery mildew	*Oidium mangifera*	• • • •

Citrus fruits	Melanose	*Diaporthe citri*	• • •
	Black spot	*Guignardia citricarpa*	• • • •
	Alternaria	*Alternaria sp.*	• • •

Rice	Sheath blight	*Corticium sasakii*	• • • •
	Glume spot	*Cercospora oryzae*	• • • •
	Brown spot	*Cochliobolus miyabeanus*	• • • •
	Snow mold	*Monographella nivalis*	• • • •

Roses	Powdery mildew	*Sphaerotheca pannosa*	• • •

Turf	Dollar spot	*Sclerotinia homoeocarpa*	• • • •
	Brown spot	*Rhizoctonia solani*	• • • •
	Curvularia leaf spot	*Curvularia* spp.	• • • •

Peanuts	Late leaf spot	*Mycosphaerella berkeleyii*	• • •
	Brown leaf spot	*Mycosphaerella arachidis*	• • • •
	Southern stem rot	*Sclerotium rolfsii*	• • •
	Stem rot	*Rhizoctonia solani*	• • • •
	Leaf blotch	*Phoma arachidicola*	• • • •
	Leaf rust	*Puccinia arachidis*	• • •

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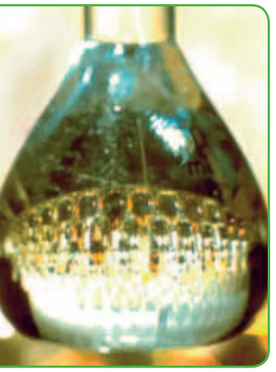
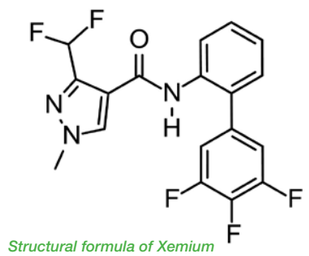
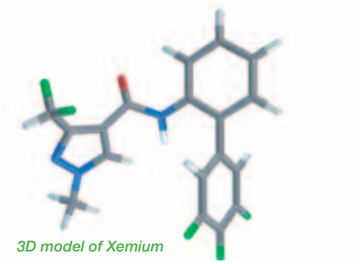
Xemium®: Physical and chemical properties



Trade name:	**Xemium**
Proposed common name:	Fluxapyroxad
Molecular weight:	381.31 g/mol
Formula:	$C_{18}H_{12}F_5N_3O$
Water solubility:	3.4 mg/L (20 °C)
log P_{ow} (measured)	3.1 (mean value)
(calculated)	2.6 - 4.3
Odor:	odorless
Melting point:	157 °C
Density:	1.42 g/cm³



Structural formula of Xemium



3D model of Xemium

Xemium: Toxicological and Ecotoxicological Data

Acute oral toxicity	LD_{50} rat > 2000 mg/kg
Acute dermal toxicity	LD_{50} rat > 2000 mg/kg
Irritation of skin	Nonirritating
Irritation of eyes	Nonirritating
Sensitization	Nonsensitizing
Mutagenicity	Nonmutagenic
Birds	Nontoxic, LD_{50} > 2000 mg/kg
Earthworms	Nontoxic, LD_{50} > 1000 mg/kg soil[1)]
Beneficial organisms (6 types) according to current results	Nontoxic with realistic exposure[1)]
Bees	Nontoxic (LD_{50} > 100 µg/bee)
Aquatic organisms	Moderately toxic to fish, LC_{50} < 10 mg/L[1), 2)] Harmful to daphnia and algae, EC_{50} > 10 mg/L[1), 2)]

[1)] Formulation used in tests
[2)] When used as instructed with good agricultural practices, there is no concern of permanent damage to aquatic organisms.

Xemium®: Use recommendations

- **Xemium** based products shall be used preventively.
- **Xemium** based products shall be applied at effective dose rates and intervals according to BASF recommendations.
- The number of **Xemium** applications within a total disease management program is limited to 3 applications per year over all diseases.
- **Xemium** based products can be applied solo or in mixture with effective mixture partners from different cross-resistance groups.
- If used solo, **Xemium** based products shall be applied in strict alternation with fungicides from a different cross-resistance group.
- When used in mixtures, **Xemium** based products can be applied with a maximum of 2 consecutive applications.

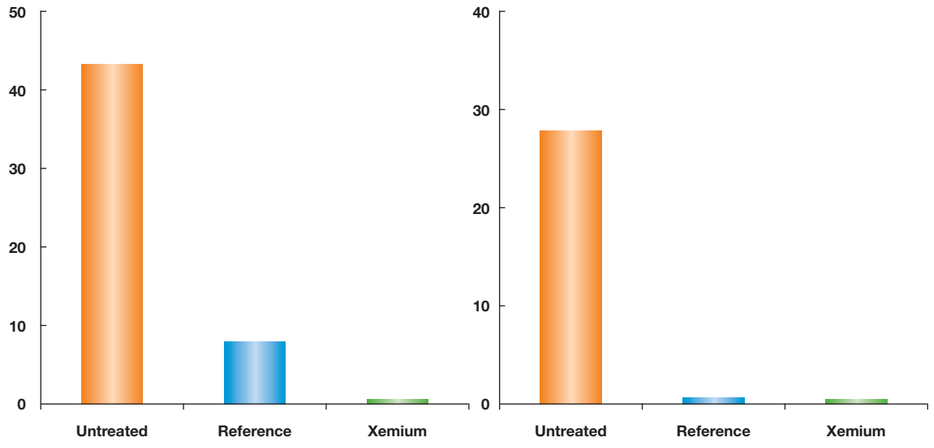
All products within the carboxamide class (SDHI) must follow the same use recommendations.

Xemium: Global MRLs and import tolerances

Xemium is currently being introduced to specialty crop growers world-wide. First registrations were obtained in the U.S. for fruits, grapes and vegetables. North American and European maximum residue levels (MRL) have been set for **Xemium** in a variety of crops. BASF has also applied for codex MRLs.

By this, **Xemium** will particularly appeal to growers who produce for export markets. Please check with your local contacts for detailed information.

Xemium®: Strong against powdery mildew in grapes



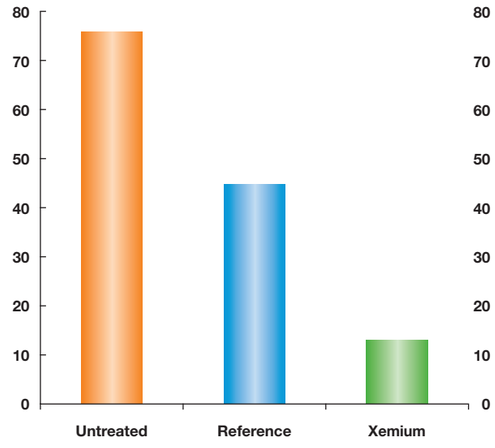
Powdery mildew attack on bunches (%)

Field trials in Europe in 2010/2011 in 6 varieties (n=9).
Reference: Quinoxyfen + Myclobutanil.

Powdery mildew attack on leaves (%)

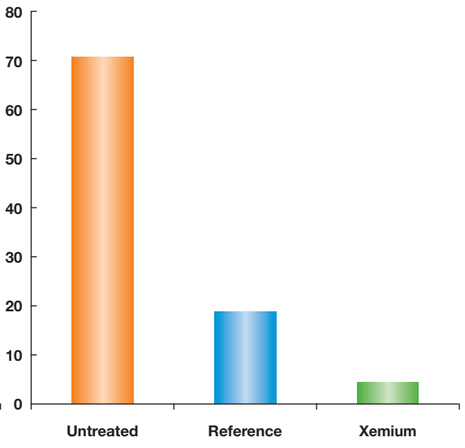
Field trials in Europe in 2010/2011 in 2 varieties (n=3).
Reference: Quinoxyfen + Myclobutanil.

Xemium®: Efficient control of powdery mildew in stone fruits



Powdery mildew attack on fruits (%)

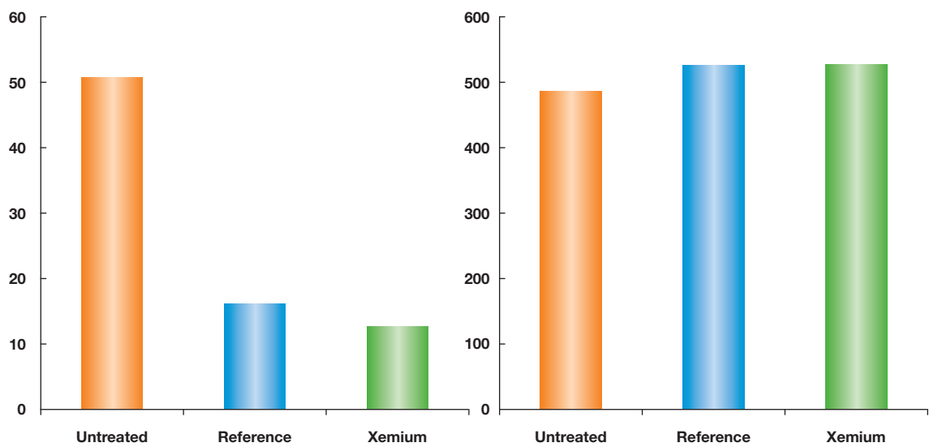
Field trials in Europe in 2011/2012 in 3 varieties (n=7).
Reference: Myclobutanil.



Powdery mildew attack on leaves (%)

Field trials in Europe in 2011 (n=4).
Reference: Myclobutanil.

Xemium: Strong against Rhizoctonia solani on potato tubers



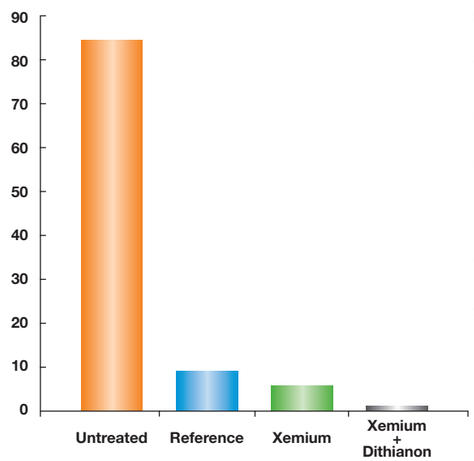
Rhizoctonia attack on tubers (%)

Field trials in Europe in 2010/2011 in 10 varieties (n=14).
Reference: Pencycuron.

Yield (dt/ha)

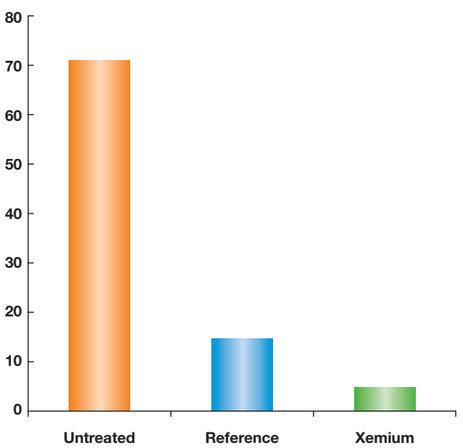
Field trials in Europe in 2010/2011 in 7 varieties (n=13).
Reference: Pencycuron.

Xemium: Combating scab and powdery mildew on apples



Scab attack on fruits (%)

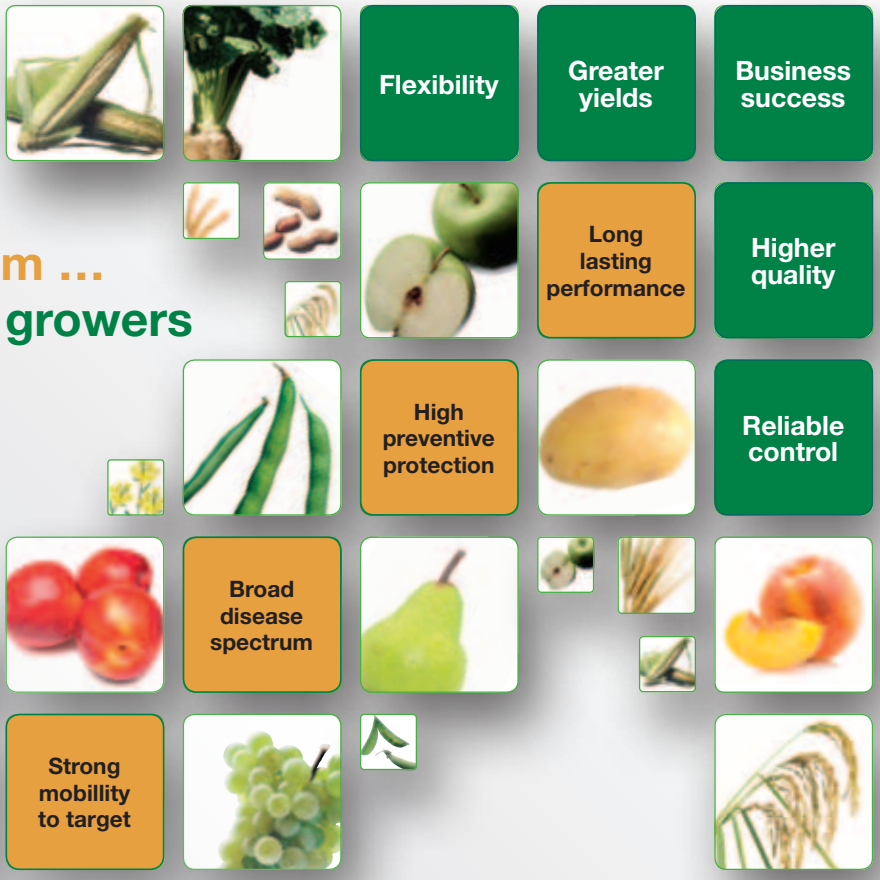
Field trials in Europe in 2011/2012 in 7 varieties (n=7).
Reference: Dithianon (DTI).



Powdery mildew attack on leaves (%)

Field trials in Europe in 2011 in 4 varieties (n=16).
Reference: Penconazol.

The Value of Xemium® for Growers



The properties of Xemium …
… and how they benefit growers

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Disclaimer

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