

Amisulbrom (NC-224)
Performance of new fungicide
for potato late blight control

EuroBlight Workshop
Nissan Chemical Industries, Ltd.
May 3, 2007

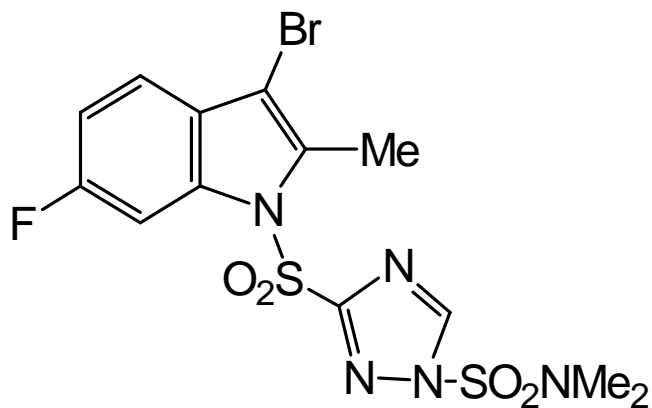
INTRODUCTION

- Nissan chemical's proprietary compound belonging to sulfonamide derivative
- Discovered in 1999 and on full development since 2002
- Oomycete specific fungicide
- Inhibition of mitochondrial complex III activity by binding Qi center
- Scheduled Regulatory approval in 2007 and after in the world

NC-224 Identification

Chemical class: Sulfonamide
Common name: amisulbrom (ISO proposed)
Chemical name: (IUPAC) 3-(3-bromo-6-fluoro-2-methylindol-1-ylsulfonyl)-*N,N*-dimethyl-1,2,4-triazole-1-sulfonamide

Structural formula:



CAS Number: 348635-87-0

Formula: C₁₃H₁₃BrFN₅O₄S₂

NC-224 20SC

- Amisulbrom 200g/L
- Adjuvant incorporated SC Formulation
- Representative Trade name “Leimay(雷鳴)”
- Intended registration (GAP) in Europe

Crop	Disease	Dose rate	Nr of applications	Spray interval	PHI
Potato	Late blight	0.5L/ha	Max 6	Min 7days	7 d
Tomato		0.6L/ha	Max 3	Min 7days	3 d

◆ **NC-224 20SC** Toxicity data

Oral rat	LD₅₀>5000mg/kg
Dermal rat	LD50>5000mg/kg
Inhalation rat	LC₅₀>6.4mg/L
Skin irritation rabbit	Not irritating
Eye irritation rabbit	Moderately irritating
Sensitization	Not sensitizing

◆ **NC-224 20SC** Ecotoxicity data

Acute - Carp	LC50= 12 mg/L
Acute - Daphnia	EC50= 0.31 mg/L
Growth inhibition - Alga	EbC50= 0.37 mg/L
Bees (oral, contact)	LD50(48hrs)> 0.1mg as/bee
Acute NTA - <i>T. pyri</i>	LR50(7d)>1000g as/ha
Acute NTA - <i>A. rhopalosiphi</i>	LR50(48hrs)>1000g as/ha
Acute – Earthworm	LC50>1000ppm

Safety to Avian is proved by studies on NC-224 Technical.

◆ **NC-224 20SC** Safety information to Environment

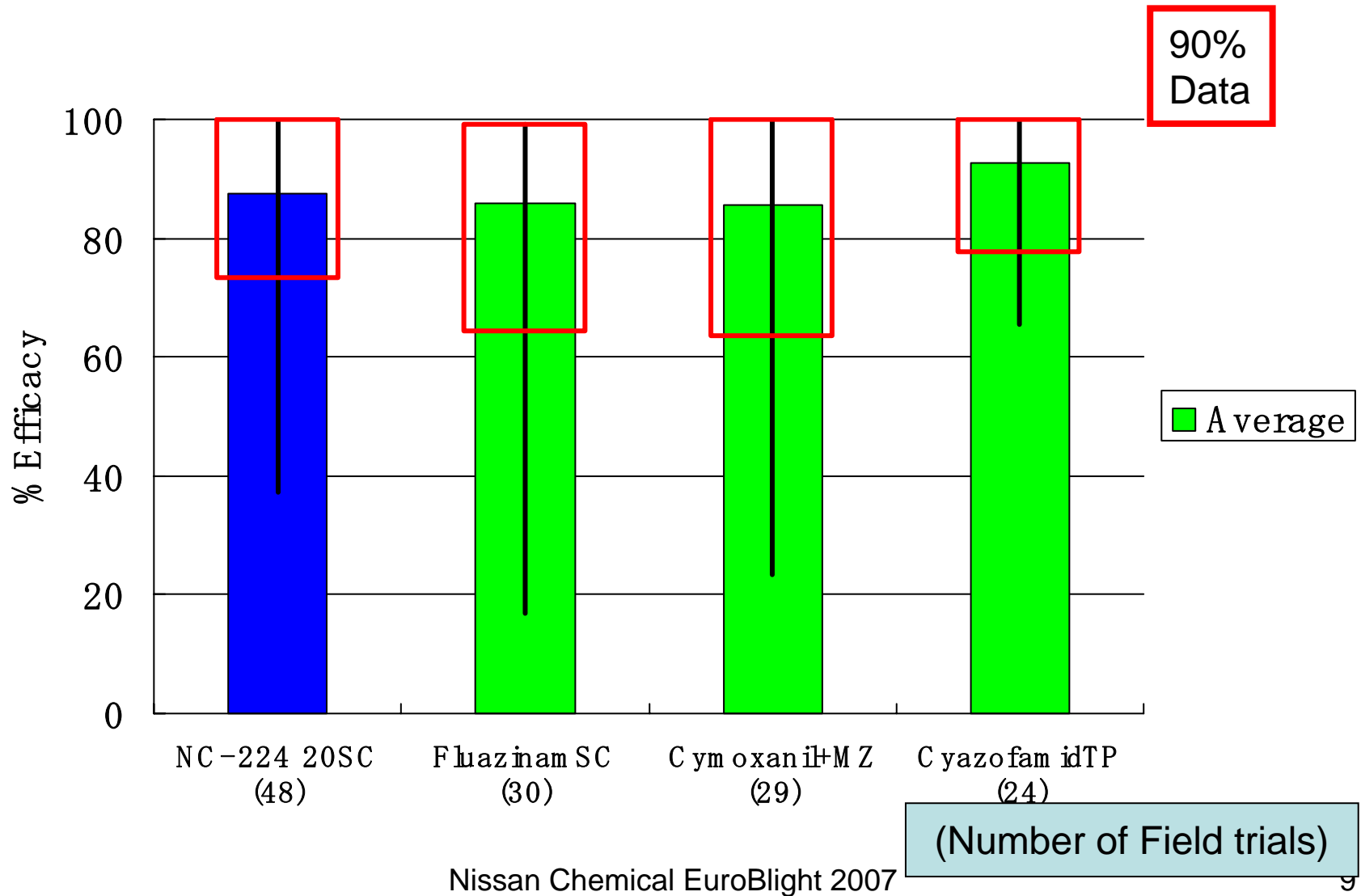
- No groundwater concern
 - $< 0.001 \mu\text{g/l}$ in all the scenarios
- Relatively short persistency in Soil
 - (from European field studies)
 - DT50 : 3 to 13 days
 - DT90 : 9 to 42 days

Number of Field Trials in North Europe on Potato late blight

Year	UK	NL	GE	FI	AT	FR
2002	5	2	2	0	0	3
2003	2	3	0	0	0	0
2004	6	2	7	2	1	4
2005	8	2	3	1	1	5
2006	0	2	0	0	1	2

In Total 64 trials conducted for 5 years

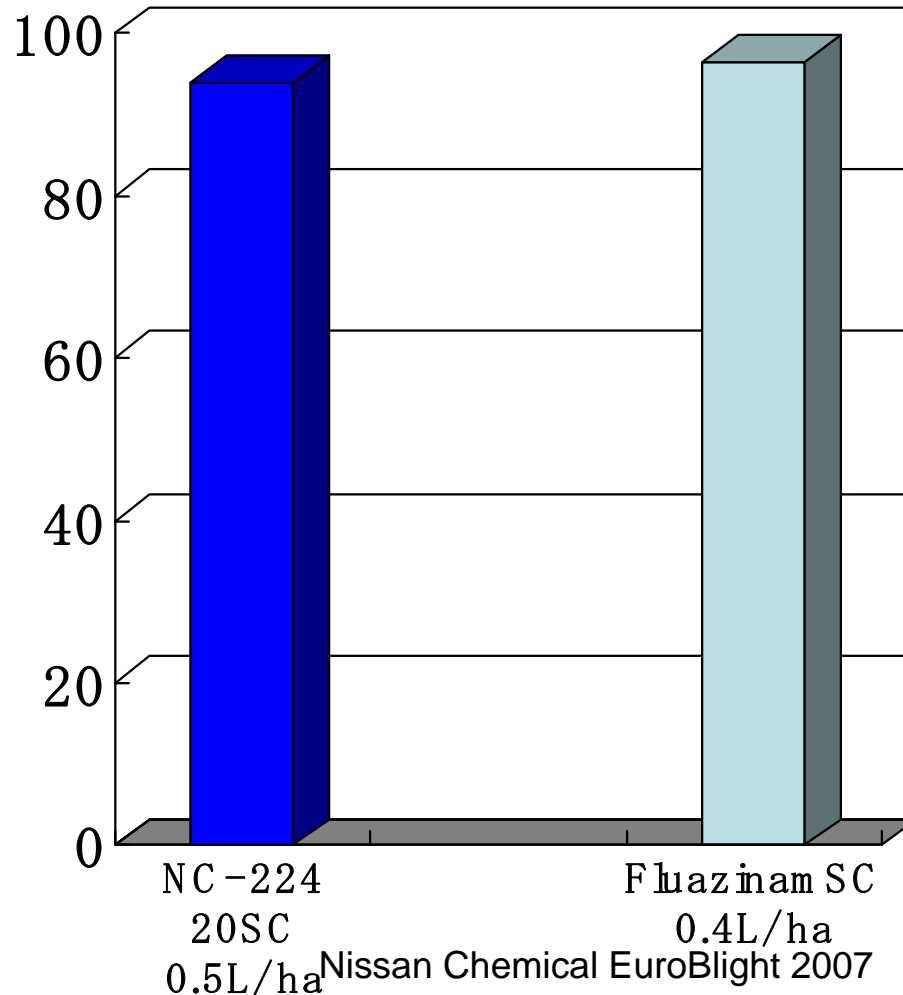
Efficacy on Foliar blight



Efficacy on Stem blight

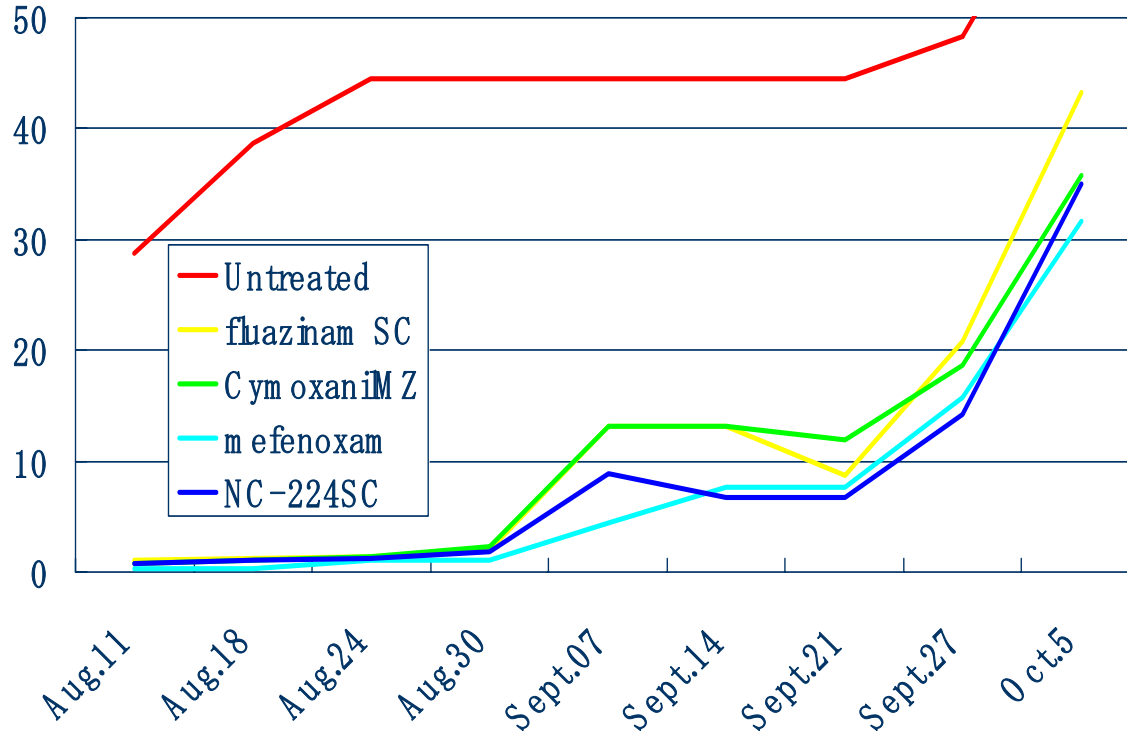
(Assessment in normal late blight field trials)

Average % Efficacy of 6 Field trials



Specific Stem blight field trial (Preventative activity, 2006 PPO)

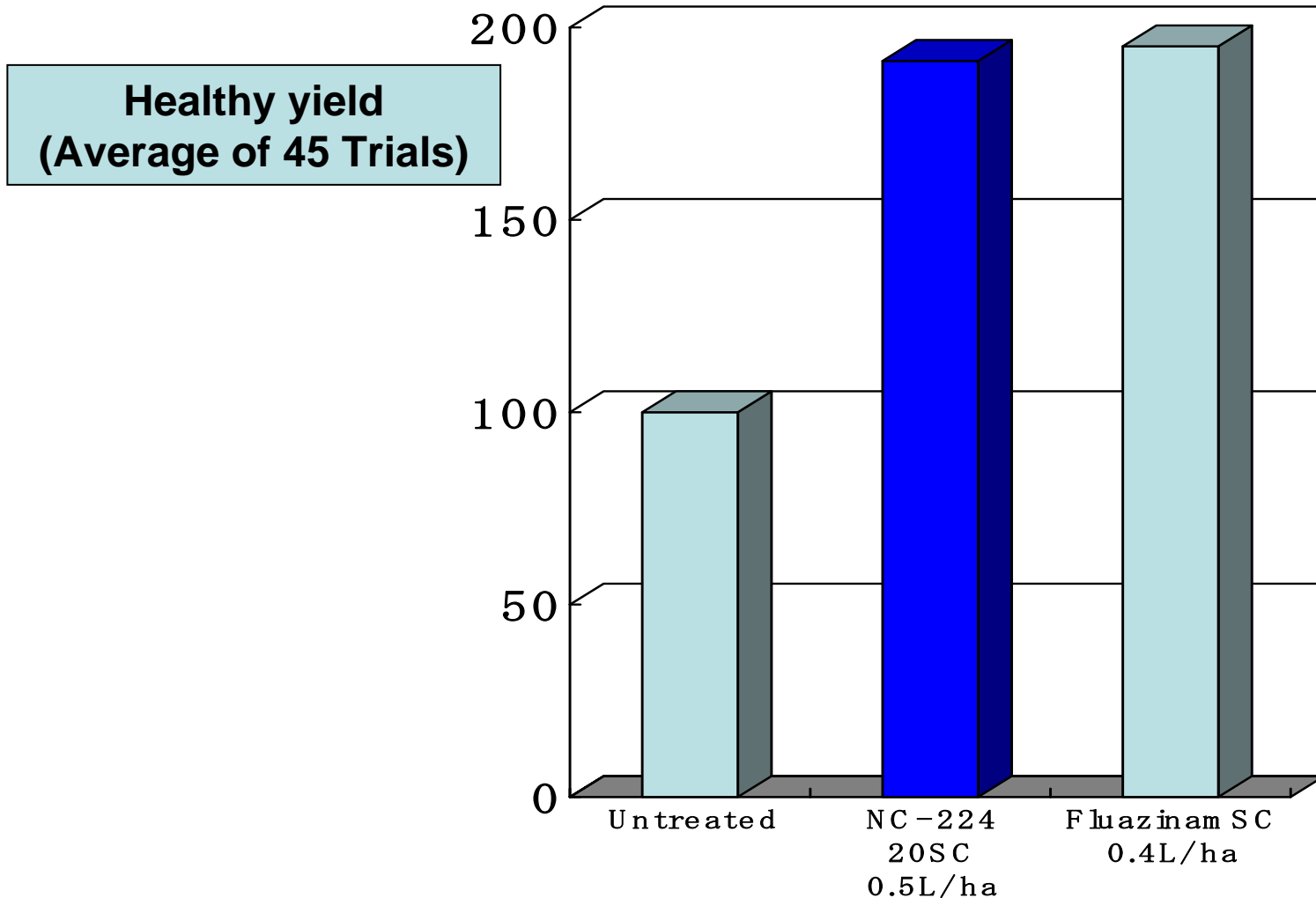
% Severity



Fungicide	AUDPC
NC-224 20SC 0.5L/ha	426
FluazinamSC 0.4L/ha	603
Cymoxanil +MZ WG 2.5kg/ha	578
Mefenoxam +MZ WG 2.5kg/ha	392
Untreated	2,570

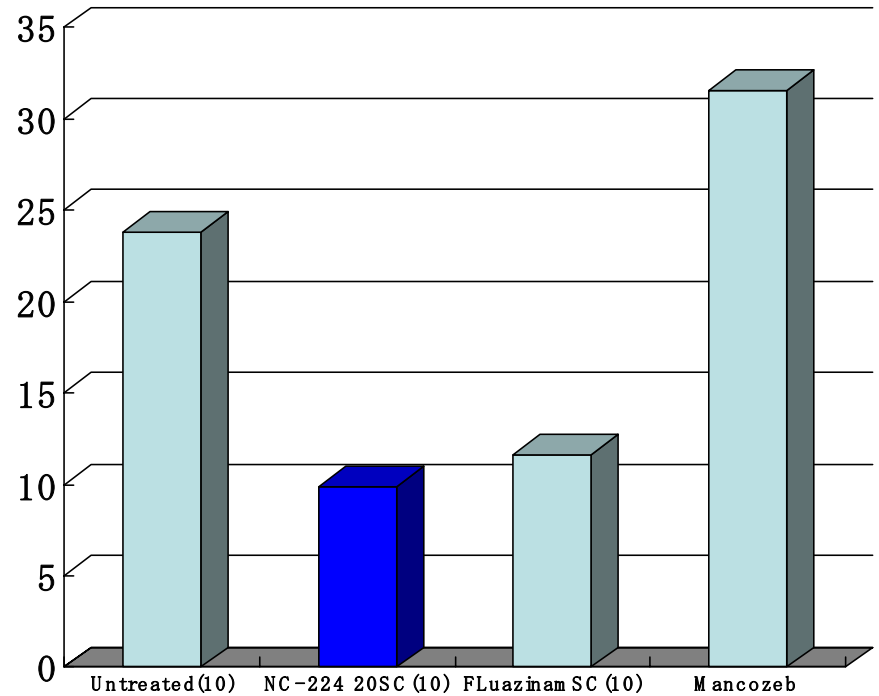
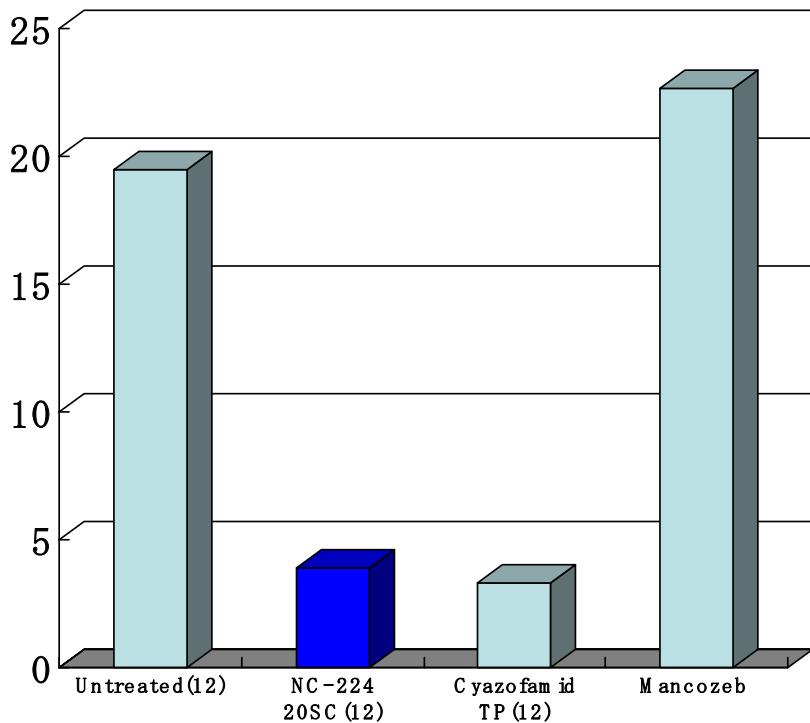
**Planting: May 17 Spray: July 6, 13 and 20
followed by Shirlan SC (Untreated plot as well)
Inoculation : July 7, 2006 by injecting 20-50
zoospores superficially in the leaf axil**

Efficacy on Tuber blight



Efficacy on Tuber blight

% Infested tubers in weight



(Number of Trials)

Anti sporulation activity (Greenhouse)

Method: Application on 5 days after inoculation
Observation of sporulation 24hr later

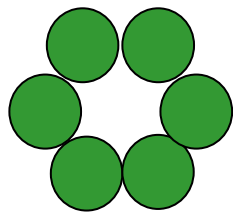
Efficacy of Anti-sporulation

100 : No sporulation 99 : Little sporulation
50 : Sporulation only lower surface
0 : Sporulation on both surfaces

Products	Dose(ppm)	Efficacy
NC-224 20SC	100	75

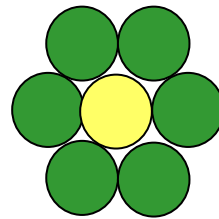
Significant Anti-sporulation at 100 ppm

Inhibition of Secondary infestation with Physical contact of Zoospore (Greenhouse)



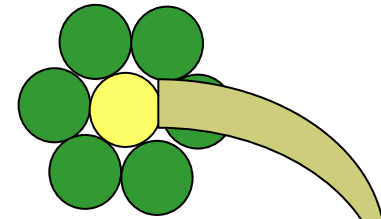
Application 2 d after inoculation

1d in dry
→



Placement of Healthy plant

6 d in humid
→



Assessment of the placed plant

	Dose (ppm)	Severity of the placed plant
NC-224 20SC	100	12

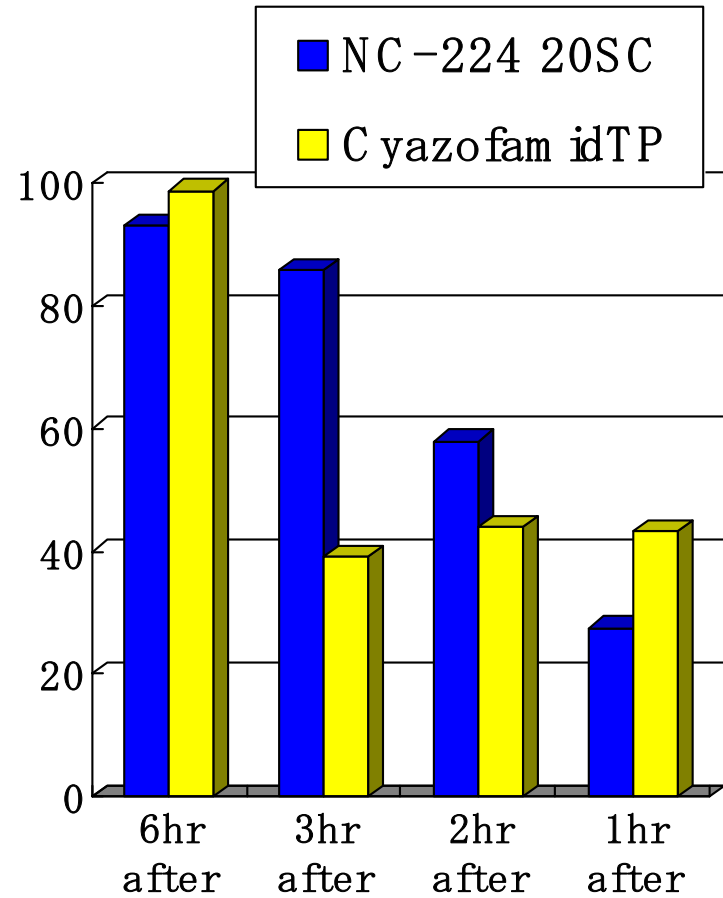
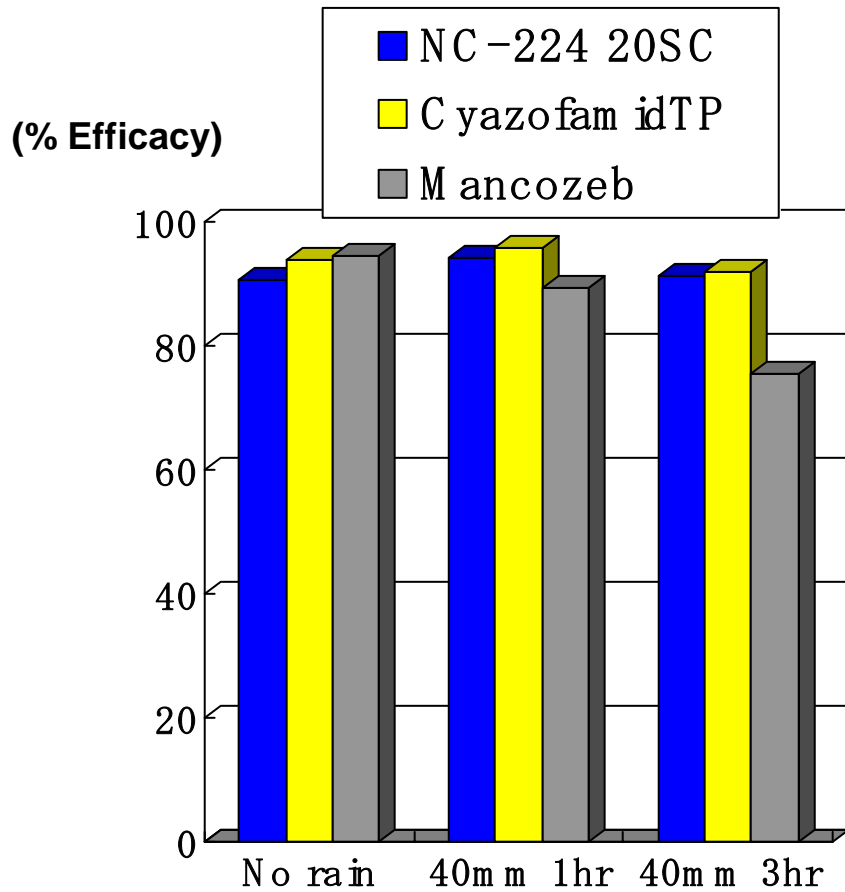
Untreated : 80% in severity

Effect on Zoospore viability by the contact with Amisulbrom on leaf surface is suggested

Rainfastness (Greenhouse)

Greenhouse Tests in Japan, 2005

Greenhouse Test in UK, 2005



Amount of Rain. 2hr after Spray

Post-spray Timing of Rain.(10mm)

Proposed rating of Amisulbrom

Product	Effectiveness				Mode of Action			Rain fastness	Mobility in plant
	Leaf blight	New growing point	Stem blight	Tuber blight	Protectant	Cura-tive	Anti-Sporu-lation		
amisulbrom	+++	?	+(+)	+++	+++	0	+(+)	+++	Contact
Cyazofamid	+++	?	+	+++	+++	0	0	+++	Contact
fluazinam	+++	?	+	++(+)	+++	0	0	++(+)	Contact

Rates of cyazofamid and fluazinam;

Ref. Proceedings 9th workshop EUnet Potato Late Blight