Mandipropamid protection of new growth from infection with late blight (*Phytophthora infestans*) in potatoes

F. Huggenberger & G. Knauf-Beiter

EuroBlight Workshop, Hamar

October 28-31, 2008

REVUS™

syngenta®

Mandipropamid, rainfastness, protection of expanding leaves and persistence of activity, Stein 2007

Methodology bioassay

treatment in field 30.5. (CS 37-38), **rapidly growing crop**

marking of ¼ size at time of treatment

sample timing 1, 3, 6 and 12 DAT

rainfall 1.6. total 15 mm 1 DAT (after first sampling)

artificial inoculation in laboratory immediately after sampling

evaluation of leaf area diseased 7 days after inoculation

Methodology field evaluations

Three applications: 30.5. (CS 37-38), 22.6. (CS 40) and 6.7. (CS 71)

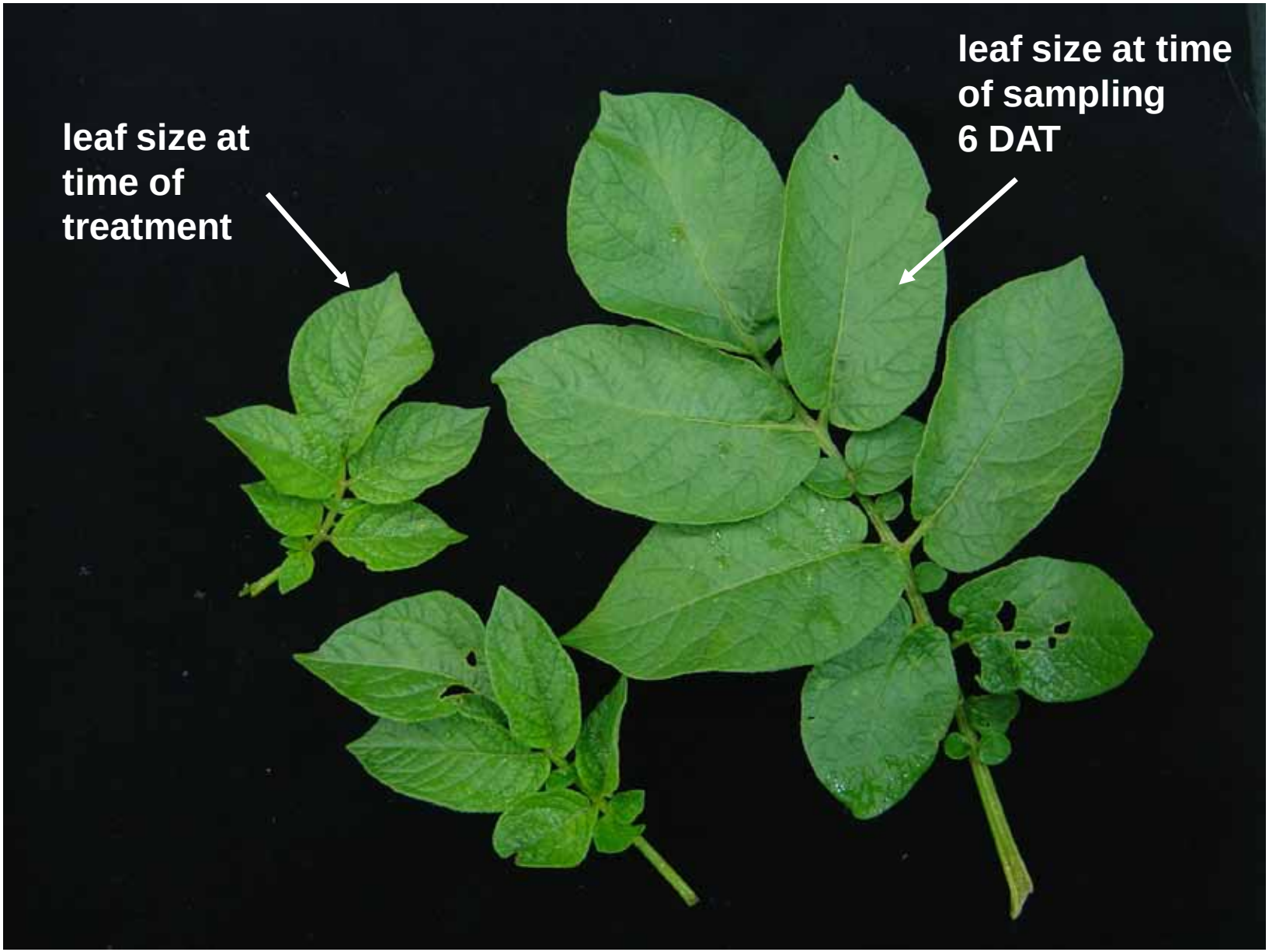
major rain events: 1.6. 15 mm, 11.6. 11 mm, 15.6. 30 mm, 21.6. 20 mm

from the end of June natural late blight infections occured in the field

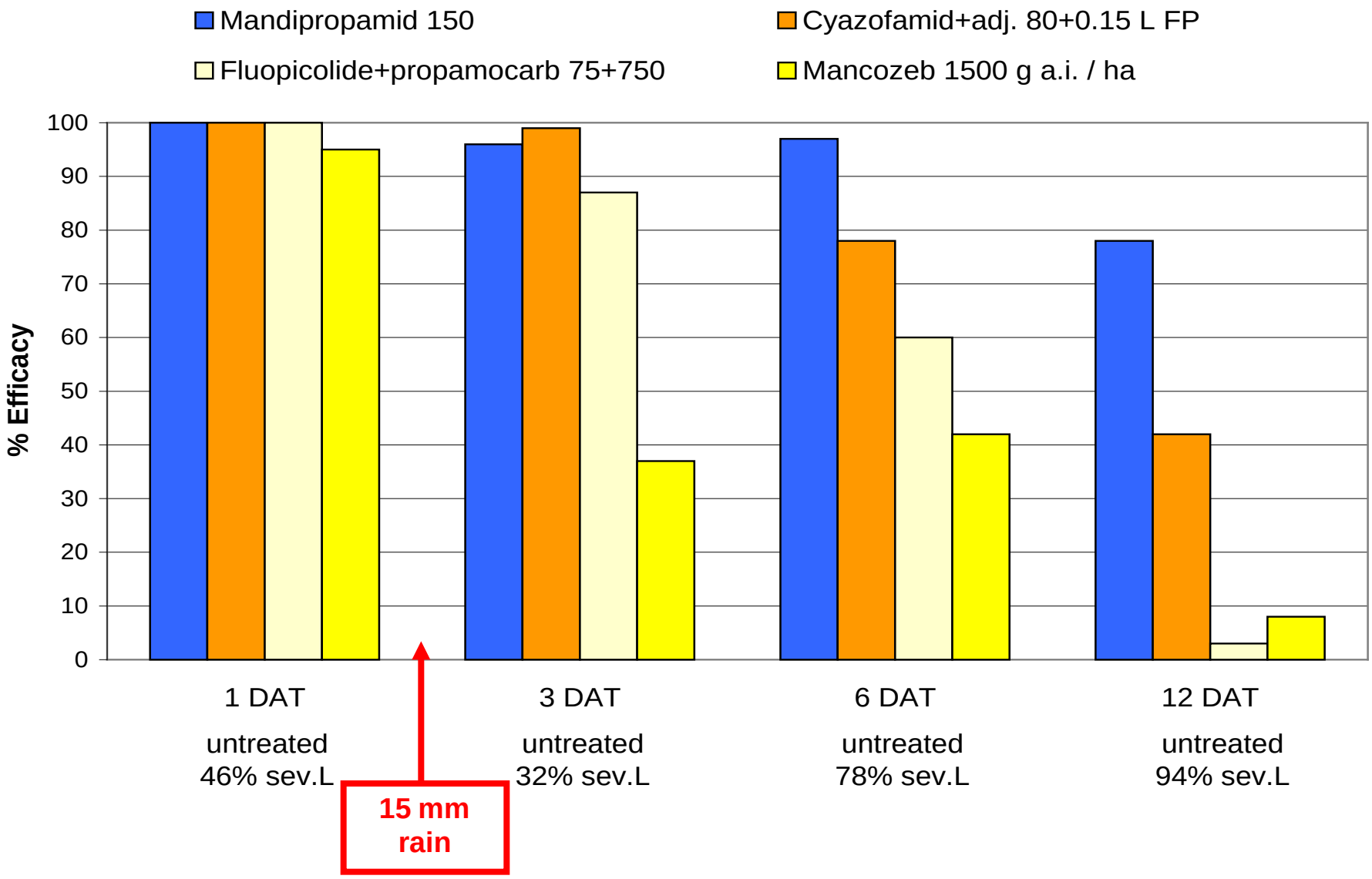
strong disease development from early July till the beginning of senescence at the end of July

in the field the the persistence of activity at the end of the crop cycle could be evaluated

Leaf size marked at the time of the treatment and at sampling

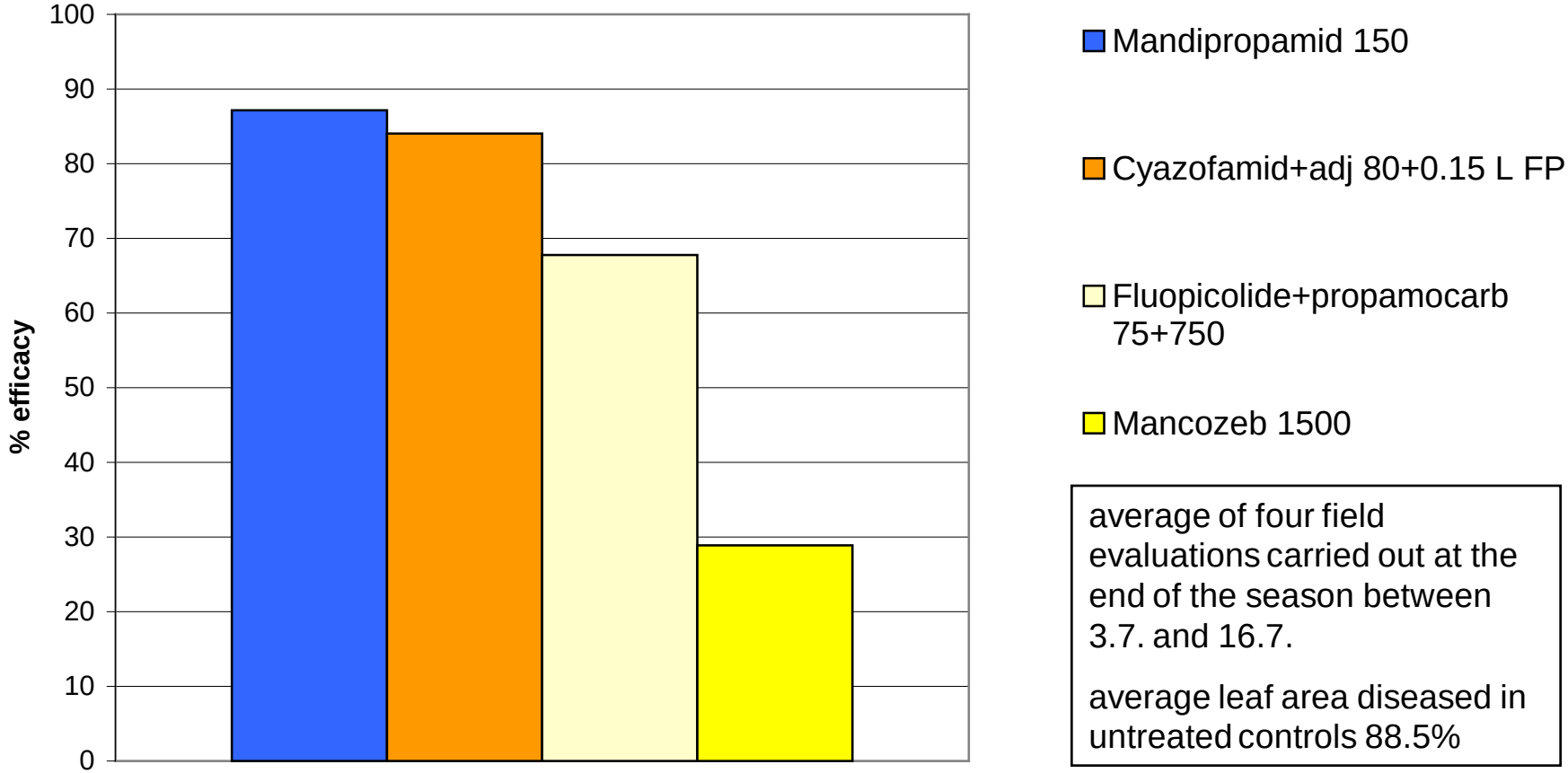


Mandipropamid against late blight in potatoes
rainfastness and protection of expanding leaves, test 2007



sampling leaves ¼ size at time of treatment, evaluation 7 days after inoculation

Mandipropamid against late blight in potatoes field efficacy, Stein, Switzerland 2007



average of four field evaluations carried out at the end of the season between 3.7. and 16.7.

average leaf area diseased in untreated controls 88.5%

appl. dates: 30.5. (CS 37-38), 22.6. (CS 40) and 6.7. (CS 71)
major rain events: 1.6. 15 mm, 11.6. 11 mm, 15.6. 30 mm, 21.6. 20 mm
natural infection from end of June, first symptoms observed early July

Mandipropamid, rainfastness, protection of expanding leaves and persistence of activity, Stein 2008

Methodology bioassay

treatment in field 10.6. (CS 35-59), **rapidly growing crop**

marking of ¼ size and fully grown leaves at time of treatment

sample timing 1, 3, 6 and 12 DAT

irrigation+rainfall 11.6. total 17 mm 1 DAT (after first sampling)

artificial inoculation in laboratory immediately after sampling

evaluation of leaf area diseased 5 days after inoculation

Methodology field evaluations

Three applications: 10.6. (CS 35-59), 8.7. (CS 69-70) and 21.7. (CS 81-85)

major rain events: 11.6. 17 mm, 11.7. 21 mm, 12./13.7. 12 mm

a natural infection in the field probably occured around 11.7., first symptoms were observed on 18.7., then strong disease development till the beginning of senescence at the end of July

in the field the rainfastness of the second treatment and the persistence of activity at the end of the crop cycle could be evaluated

¼ size T+0

T+1

T+3

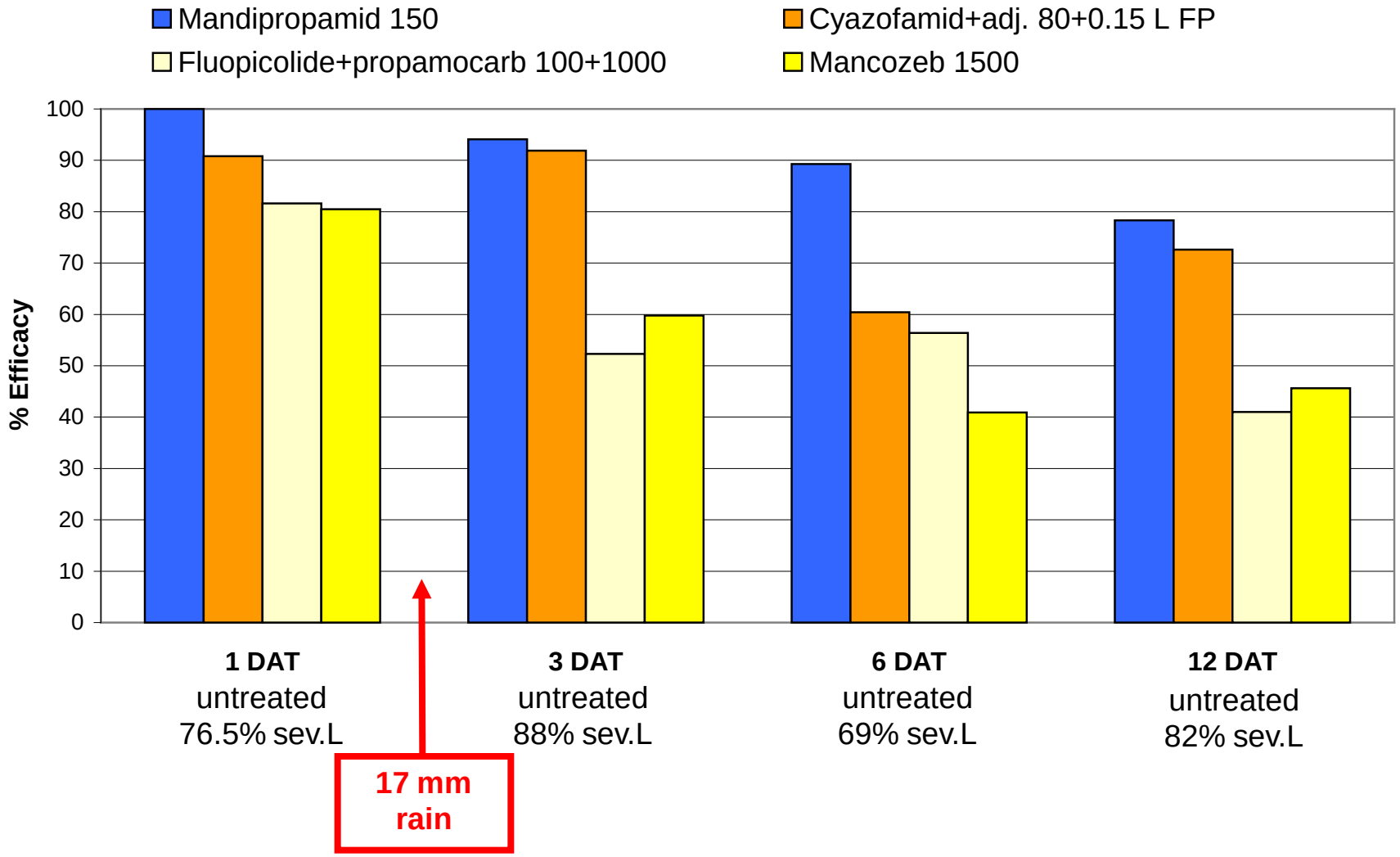
T+6

first pair of leaflets were sampled at each timing, rapidly expanding leaves within 6 days

T+12

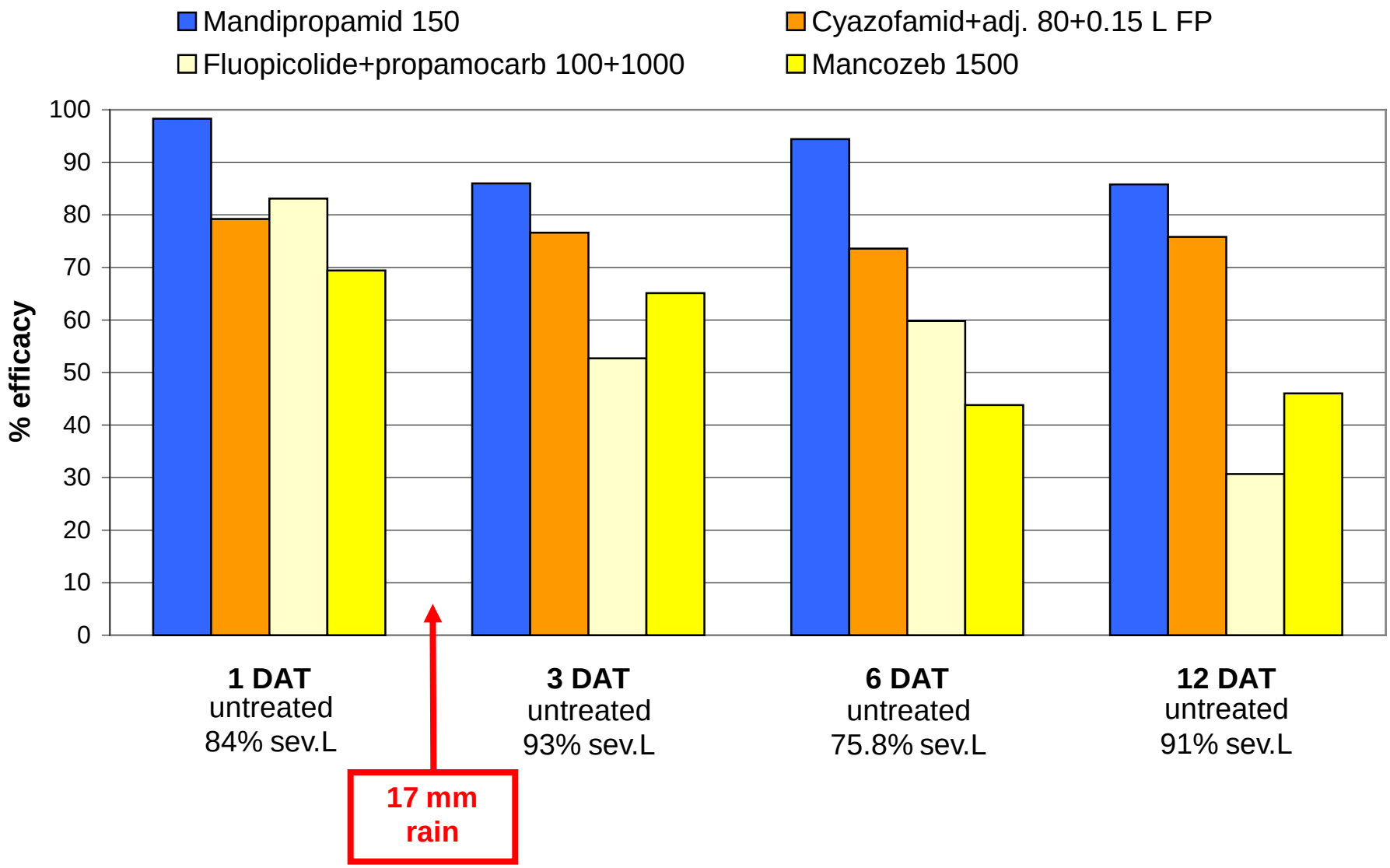
Mandipropamid against late blight in potatoes rainfastness and protection of expanding leaves, test 2008

sampling leaves ¼ size at time of treatment, evaluation 5 days after inoculation

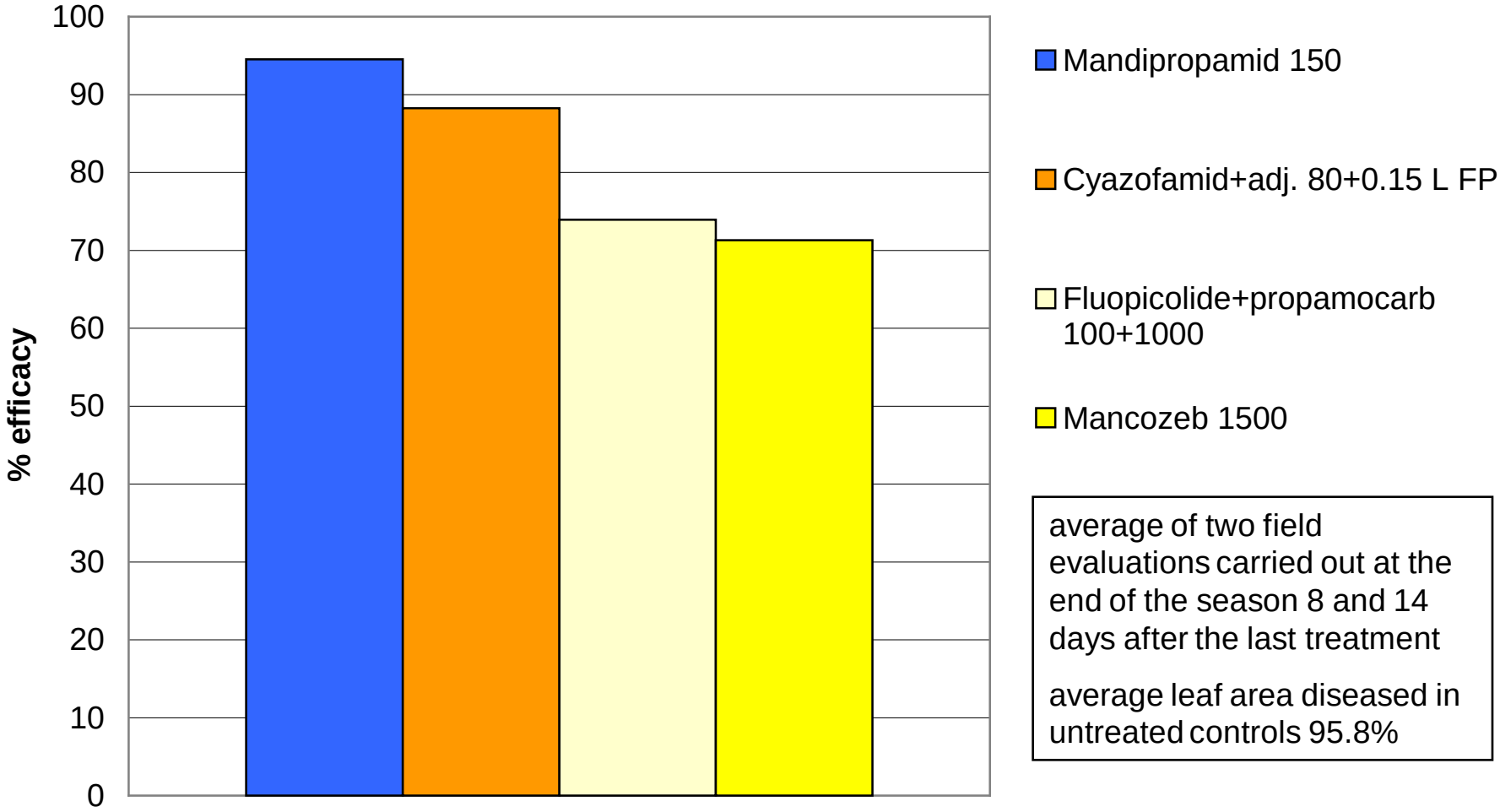


Mandipropamid against late blight in potatoes rainfastness and persistence of activity, test 2008

sampling leaves full size at time of treatment, evaluation 5 days after inoculation



Mandipropamid against late blight in potatoes
field efficacy, Stein, Switzerland 2008

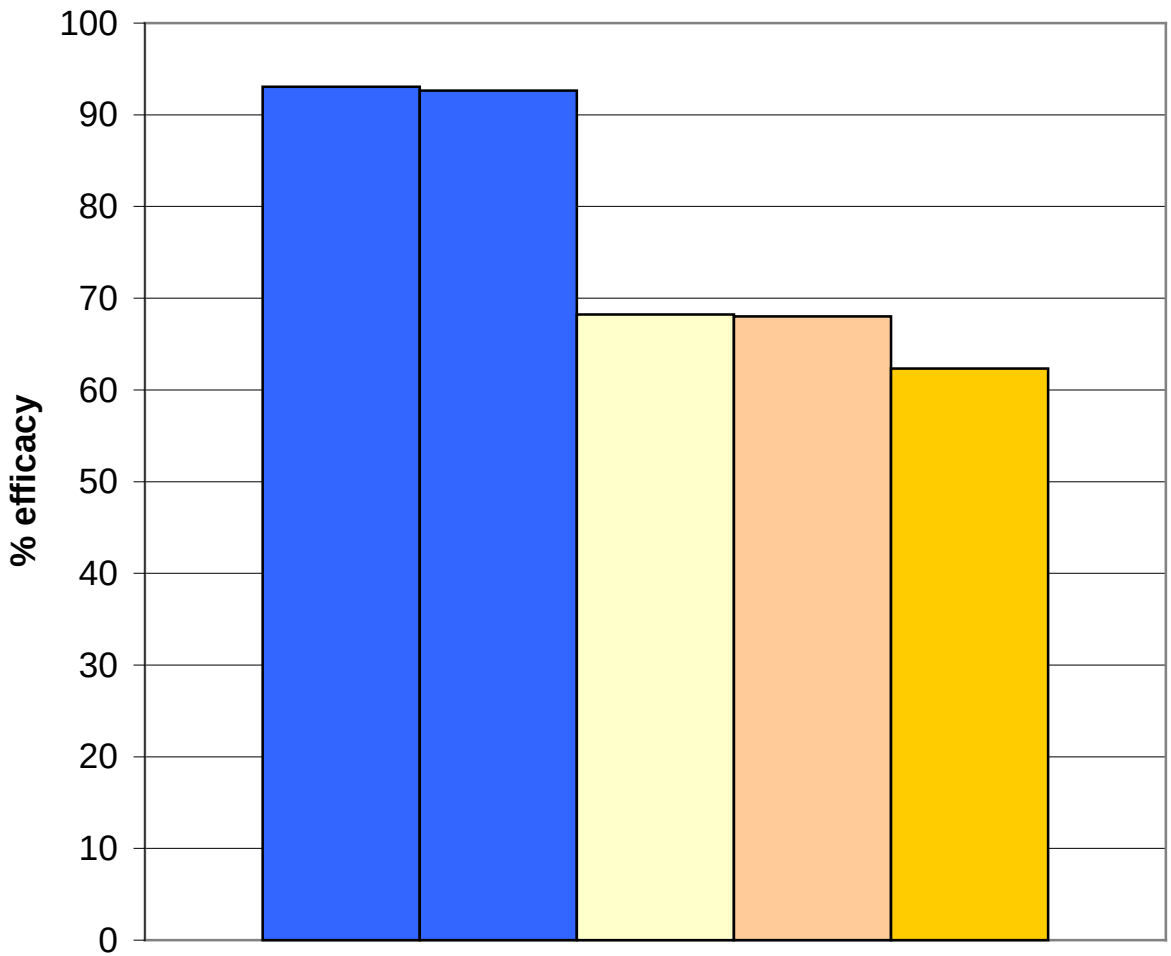


average of two field evaluations carried out at the end of the season 8 and 14 days after the last treatment

average leaf area diseased in untreated controls 95.8%

appl. dates: 10.6. (CS 35-59), 8.7. (CS 69-70), 21.7. (CS 81-85)
major rain events: 11.6. 17 mm, 11.7. 21 mm, 12./13.7. 12 mm
natural infection around 11.7., first symptoms observed 18.7.

Mandipropamid, protection of expanding leaves
field / laboratory study H. Schepers NL 2007



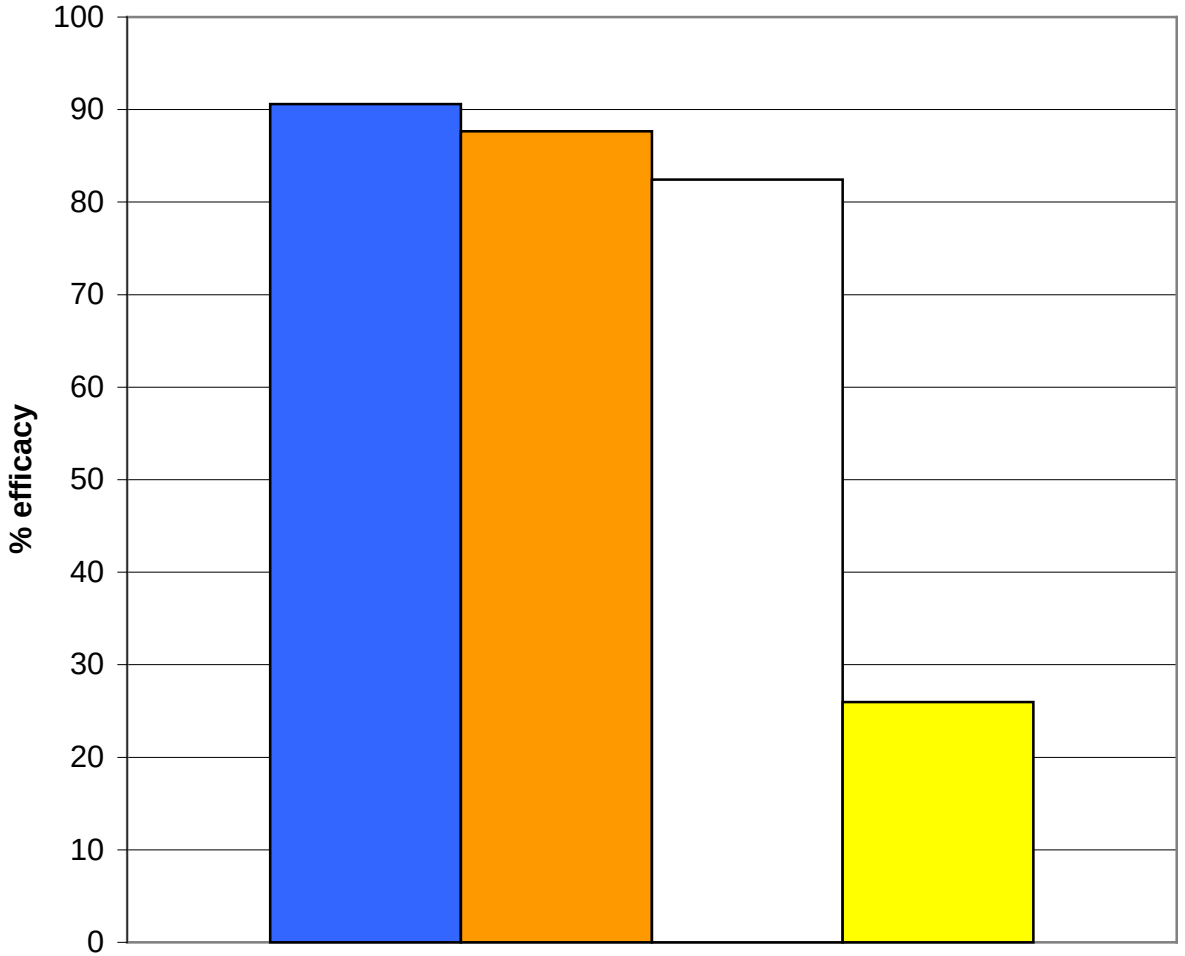
- Mandipropamid 150
- Mandipropamid 100
- Fluopicolide+propamocarb 100+1000
- Benthiavalicarb+mancozeb 25+1400
- Cymoxanil+mancozeb 112.5+1700

treatment 15.6.

sampling and inoculation of leaves of 3 levels 21.6.
(6 DAT)

evaluation of bioassay 27.6.
(6 days after inoculation in laboratory)

Mandipropamid, protection of expanding leaves field / laboratory study R. Bain SAC UK 2007



Mandipropamid 150

Cyazofamid+adj. 80

Fenamidone+propamocarb 150+750

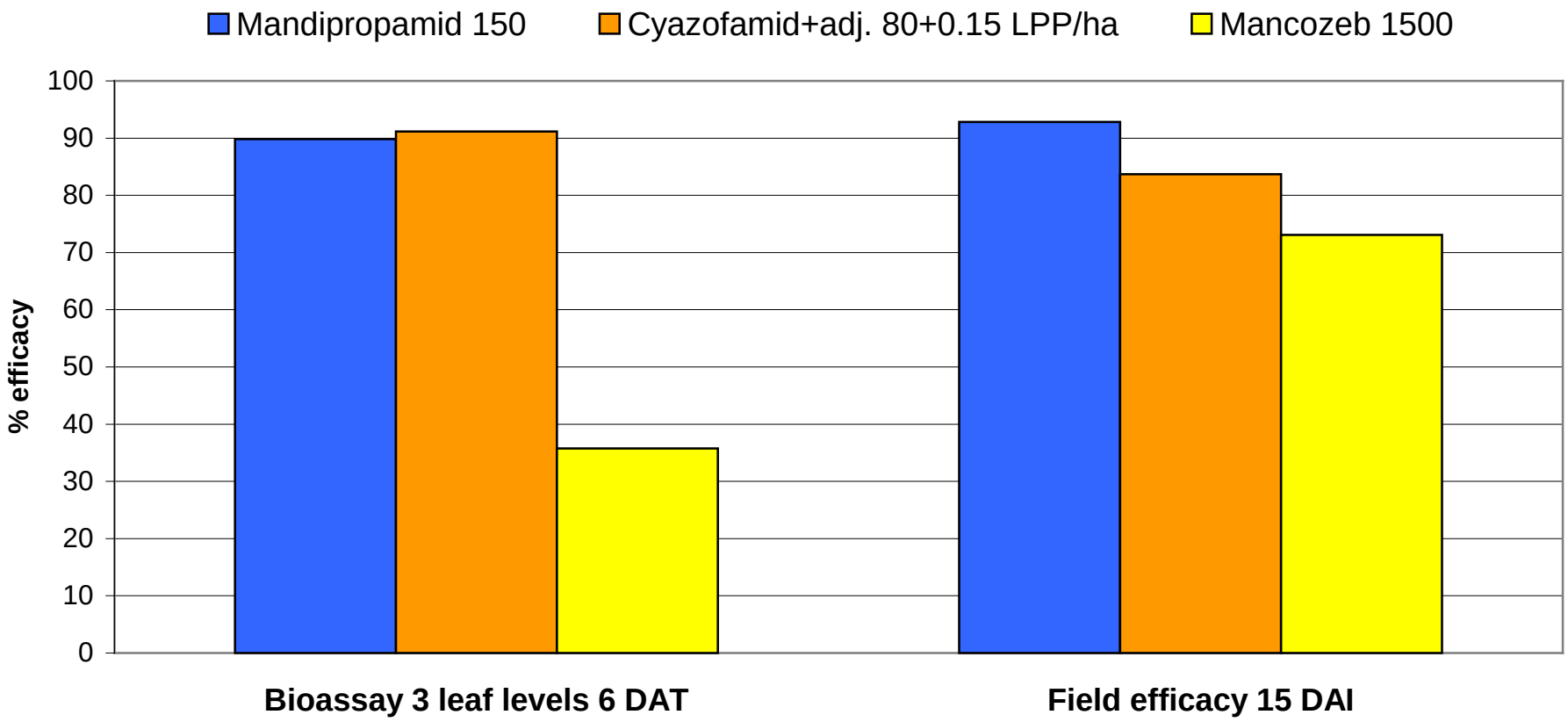
Mancozeb 150

tagging of youngest leaves 16.8.; treatment in field 17.8.

sampling and inoculation of leaves developing above tagged leaves 21.8. (4 DAT)

evaluation of leaves sampled 27.8.; average of three different evaluations

Mandipropamid protection of expanding leaves in potatoes
preliminary results Flakkebjerg DK, B. Nielsen 2008

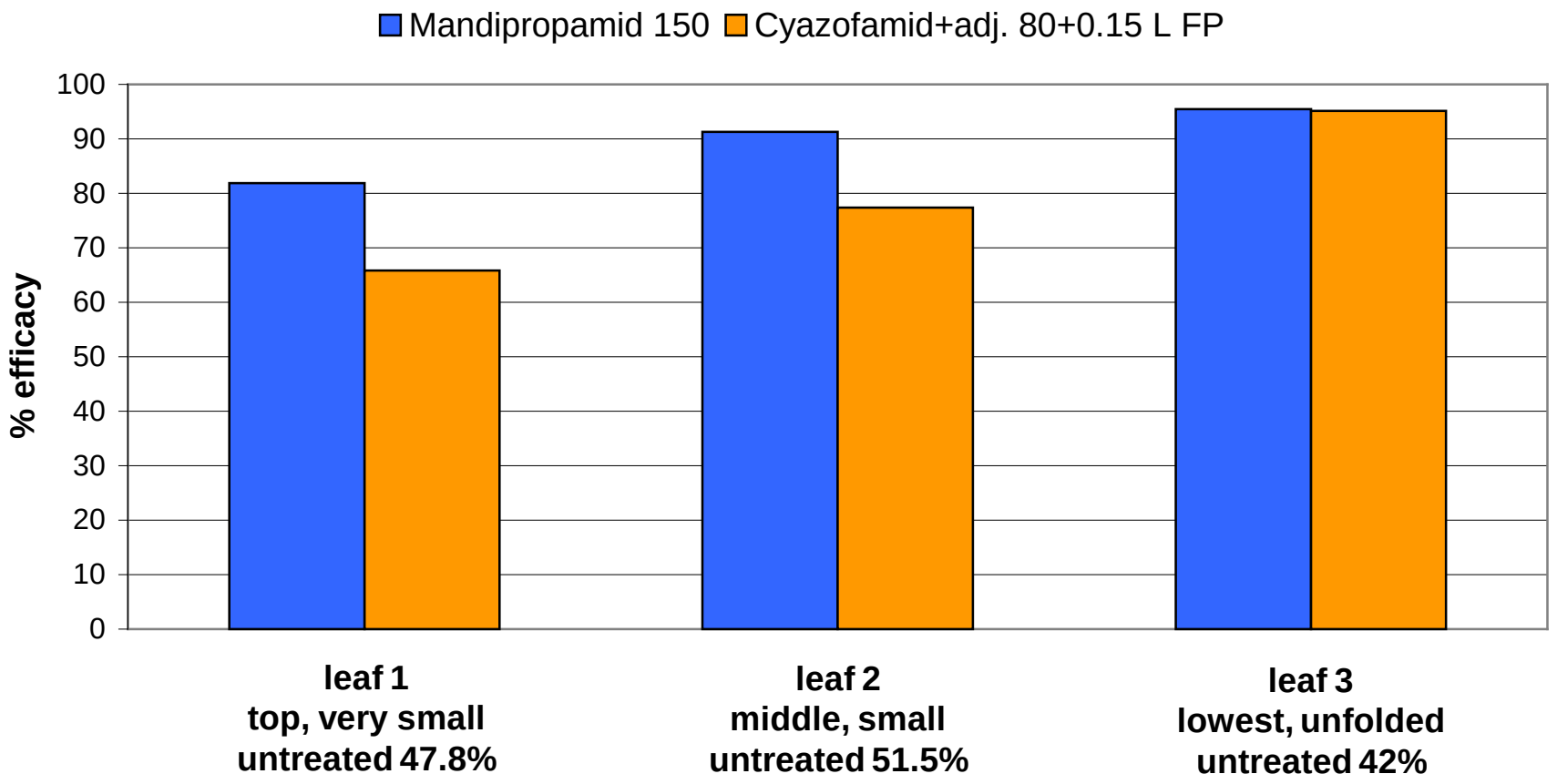


treatment 19.6., sampling for bioassay 25.6., evaluation bioassay 1.7., artificial inoculation in the field 25.6. (after sampling), field evaluation 10.7.

Mandipropamid protection of expanding leaves, Finland 2008

A. Hannukkala & P. Laine, MTT Agrifood Research, Jokioinen, Finland

sampling 3 top leaves, 5 days after treatment, evaluations 4 & 5 days after inoculation

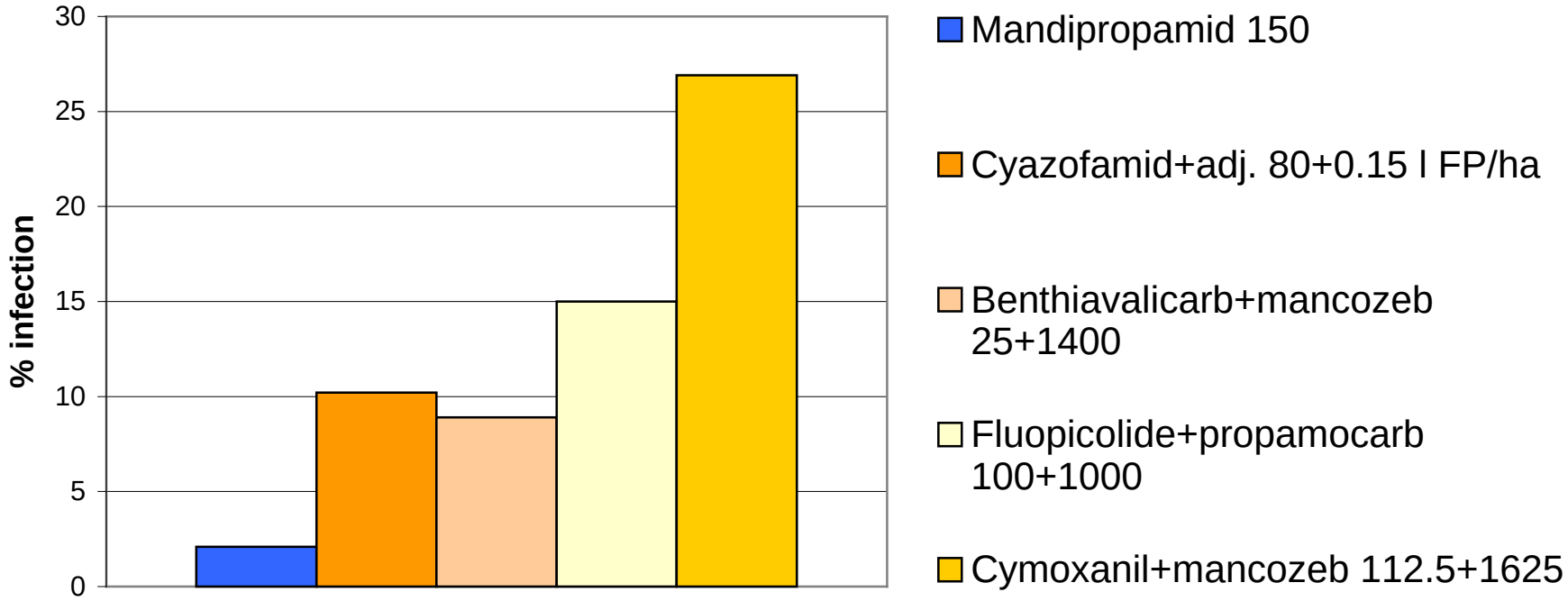


leaves of different sizes (see above) tagged in the field on 6 plants/plot; plots treated July 25; sampling by leaf size 5 days after treatment; inoculation immediately after sampling; average efficacy of evaluations carried out 4 & 5 days after inoculation are presented

Mandipropamid protection of expanding leaves, Finland 2008

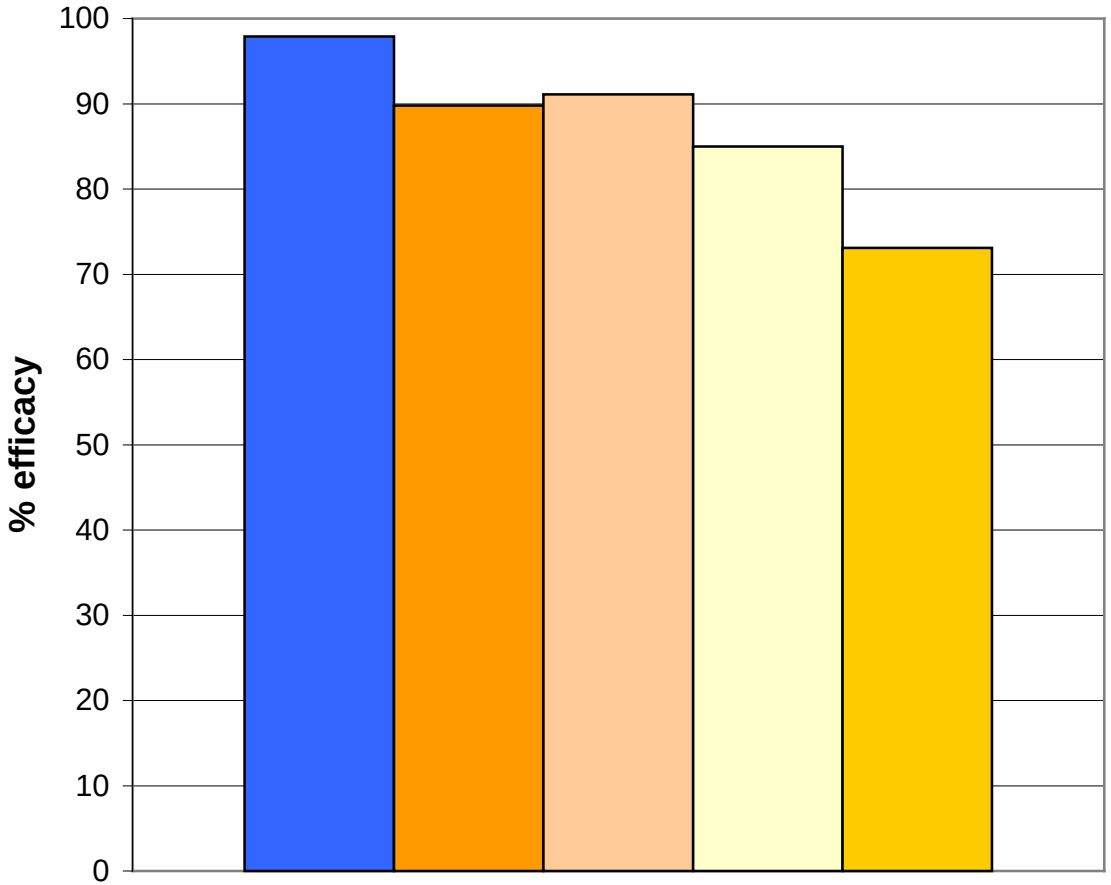
A. Hannukkala & P. Laine, MTT Agrifood Research, Jokioinen, Finland

Mandipropamid protection of expanding leaves in potatoes
preliminary results PPO NL, R. Kalkdijk / H. Schepers 2008



results from laboratory bioassays,
leaf infection, average of 4 leaf levels

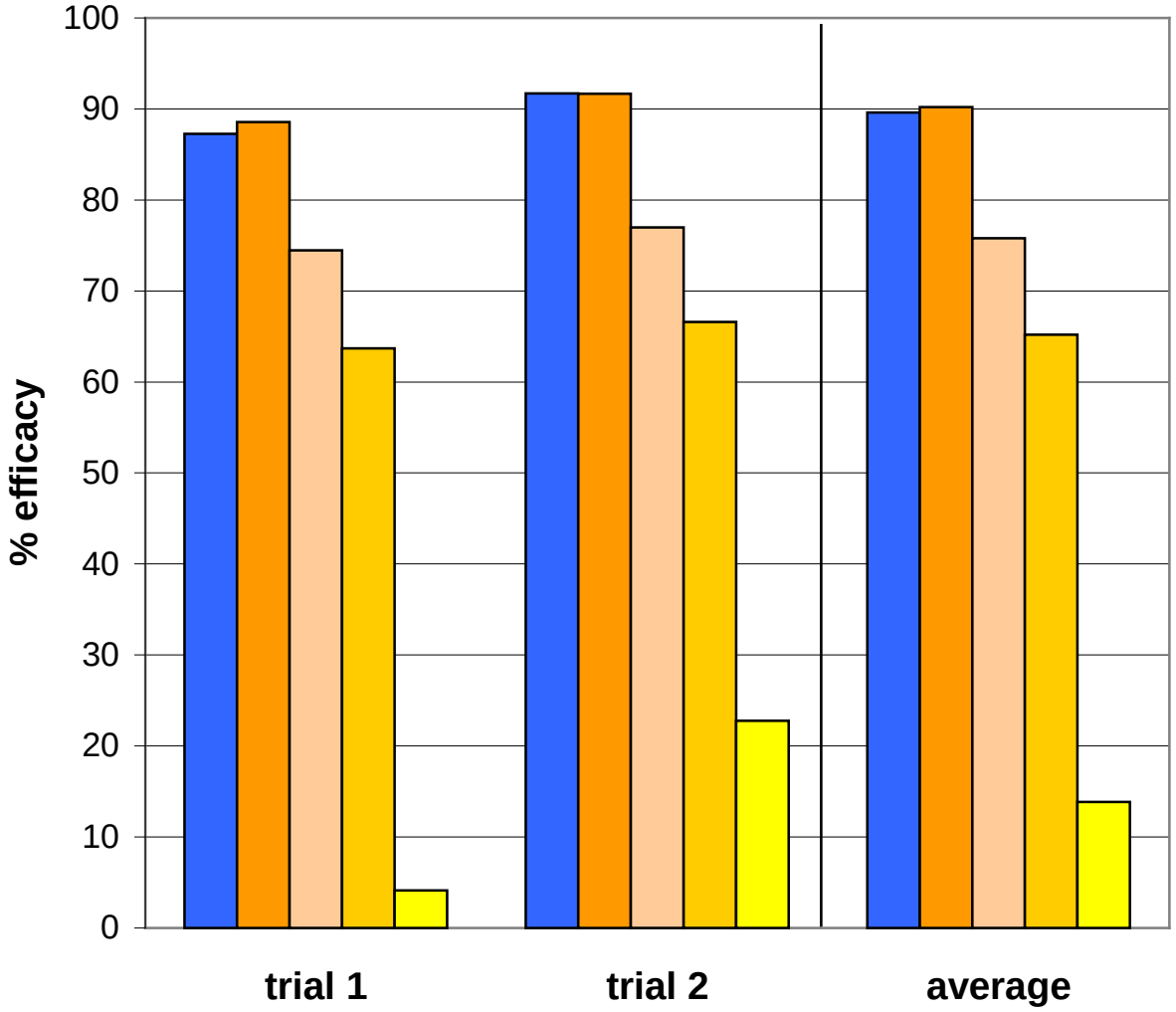
Mandipropamid protection of expanding leaves in potatoes preliminary results PPO NL, R. Kalkdijk / H. Schepers 2008



- Mandipropamid 150
- Cyazofamid+adj. 80+0.15 l FP/ha
- Benthiavalicarb+mancozeb 25+1400
- Fluopicolide+propamocarb 100+1000
- Cymoxanil+mancozeb 112.5+1625

results from laboratory bioassays, leaf infection, average of 4 leaf levels, results converted to % efficacy based on 100% infection in untreated controls

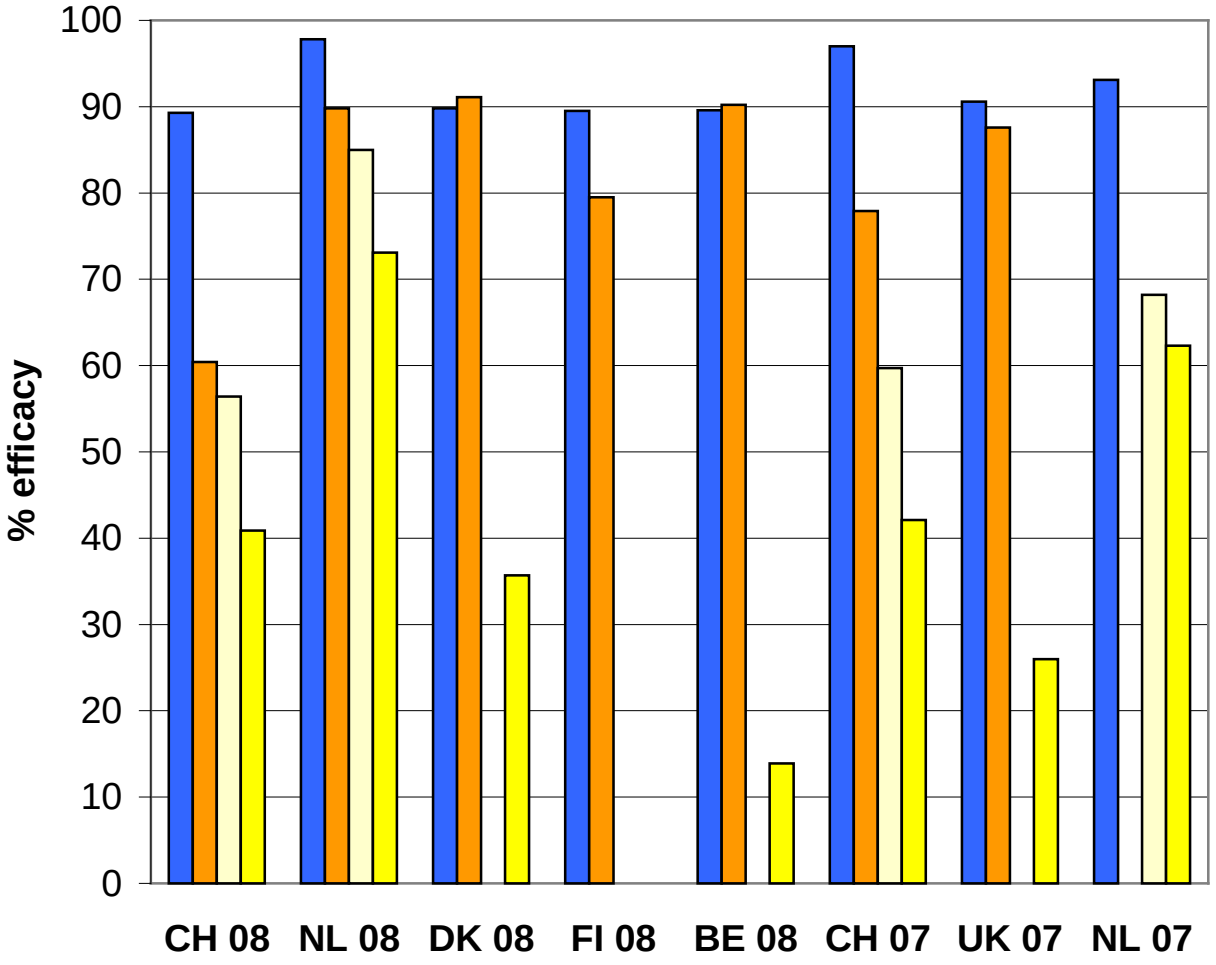
Mandipropamid protection of expanding leaves, Belgium 2008
B. Heremans, Faculty of Biosciences, University of Gent



- Mandipropamid 150
- Cyazofamid+adj. 80+0.15 l FP/ha
- Benthiavalicarb+mancozeb 25+1400
- Cymoxanil + mancozeb 112.5+1700
- Mancozeb 1500

leaf area infected in untreated controls:
trial 1: 87.0%
trial 2: 95.2%
average 91.1%

Mandipropamid for the protection of new growth in potatoes
Summary 2007 / 2008, bioassays: sampling 6 DAT *



Mandipropamid 150

Cyazofamid+adj. 80+0.15 L FP

Fluopicolide+propamocarb 100+1000 **

Mancozeb 1500 ***

* in FI 5 DAT

** in CH 07 75+750

*** in NL 07 & NL 08 cymoxanil+mancozeb 112.5+1700

Conclusions: REVUS - protection of new growth

REVUS provides consistently excellent protection of new growth in different tests using different methodology.

Results of bioassays are consistent with field evaluations.

REVUS is at least as effective as RANMAN+adj. for the protection of new growth.

REVUS is clearly more effective in these tests than DITHANE, CURZATE M, VALBON or INFINITO.

We propose REVUS be rated ++ the same as RANMAN+adj. for the category “protection of new growth” in the EUROBLIGHT rating table.