EuroBlight Alternaria experiments 2015

The first results

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Aim

- Set up experiment for a decimal rating for Alternaria fungicides
- Up to now ratings are given + system
- Rating does not distinguish between fungicides specifically aimed at early blight control and fungicide for late blight control with a side effect on early blight

Early blight fungicide table

Updated 18 February 2016.

Efficacy of fungicides for the control of early blight caused by *Alternaria solani* and *Alternaria alternata*.

Product	Efficacy
azoxystrobin[4]	+++(+)
fluazinam	(+)
metiram/mancozeb[1]	++
propineb	++
chlorothalonil	+(+)
famoxadone[4]+cymoxanil	++
fenamidone[4]+mancozeb or propamocarb[2]	++
zoxamide+mancozeb	++(+)
pyraclostrobin[4] + boscalid[5]	+++(+)
difenoconazole + mandipropamid	+++
difenoconazole[3]	+++

Key to ratings : 0 = no effect ; + = some effect; ++ =reasonable effect ; +++ = good effect ; ++++ very good effect

- [1] This rating applies to products containing mancozeb when used at the highest dose rates (>1500g/ha). This rating may not be appropriate where the rate of mancozeb used is lower, particularly where the second active substance is not effective against Alternaria.
- [2] In some trials there were indications that the rating was ++(+).
- [3] In some trials there were indications that the rating was +++(+).
- [4] *Alternaria solani* isolates that are less sensitive to QoI-fungicides have been isolated from potato plants in Europe. Therefore resistance management strategies should be implemented (see FRAC web site for details).
- [5] *Alternaria solani* isolates that are less sensitive to SDHI-fungicides have been isolated from potato plants in some Western European countries. Therefore resistance management strategies should be implemented (see FRAC web site for details.

Ratings will be lower where fungicide insensitive strains are present.

Disclaimer: this is given in the text of the paper from the Limassol and Brasov Workshop.

Agreements Brasov

- Protocol for fungicide efficacy to provide ratings for Alternaria fungicides
- Susceptible variety
- Randomised block design
- Untreated included as plot or spreader row
- Natural infection preferred.
    - Infection via infected wheat kernels allowed

Agreements Brasov

- Reference fungicide
  - mancozeb 7 day interval
  - mancozeb 14 day interval
- First application 6 – 8 weeks after crop emergence
- Disease severity assessed weekly
- For a rating 6 trials with good results are required
- In 2015 3 experiments were carried out.
- In 2016 a further 3 experiments are planned.

Treatments in 2015

Table 1. Fungicides sprayed in the experiments.

Fungicide	Active ingredient	Dose rate L or kg /ha	Spray interval days	Company
A-15-14-01	-	-	14	-
A-15-14-02	-	-	14	-
A-15-14-03	-	-	14	-
A-15-14-04	-	-	14	-
A-15-14-05	-	-	14	-
A-15-14-06	-	-	14	-
A-15-7-01	-	-	7	-
A-15-7-02	-	-	7	-
A-15-7-03	-	-	7	-
A-15-7-04	-	-	7	-
A-15-7-05	-	-	7	-
A-15-7-06	-	-	7	-
A-15-7-07	-	-	7	-
A-15-7-08	-	-	7	-
A-15-7-09	-	-	7	-
mancozeb 14	mancozeb	1.5[1]	14	-
mancozeb 7	mancozeb	1.5[1]	7	-
UTC	-	-	-	-

[1]: dose rate of the active ingredient mancozeb; various products may have been used.

Locations

Table 1. Experimental conditions at the different locations 2015.

Experimental conditions	Denmark	Germany	the Netherlands
Location	Flakkebjerg	Kirchheim	Valthermond
Soil		Pararendzina	Reclaimed peat
Planting	25 April	13 April	8 May
Variety	Kardal	Maxilla	Festien
Crop emergence	1 June	11 May	4 June
Inoculation	24 June	-	27 July
Haulm killing spreader rows		-	-
Specific sprayings June		-	-
Specific sprayings July	13[1], 20, 28	10[1], 17, 24	30[1]
Specific sprayings August	4, 11	3, 10	6, 13, 20 & 26
Specific sprayings September	-	-	3, 10, 18
Haulm kill			15 October

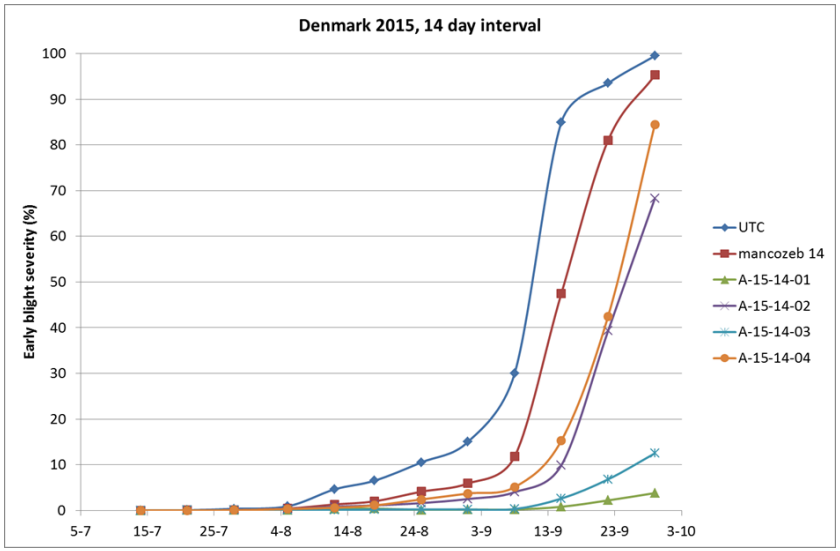
[1]: first specific Alternaria spray application. Depending on the treatment the spray interval was 7 or 14 days.

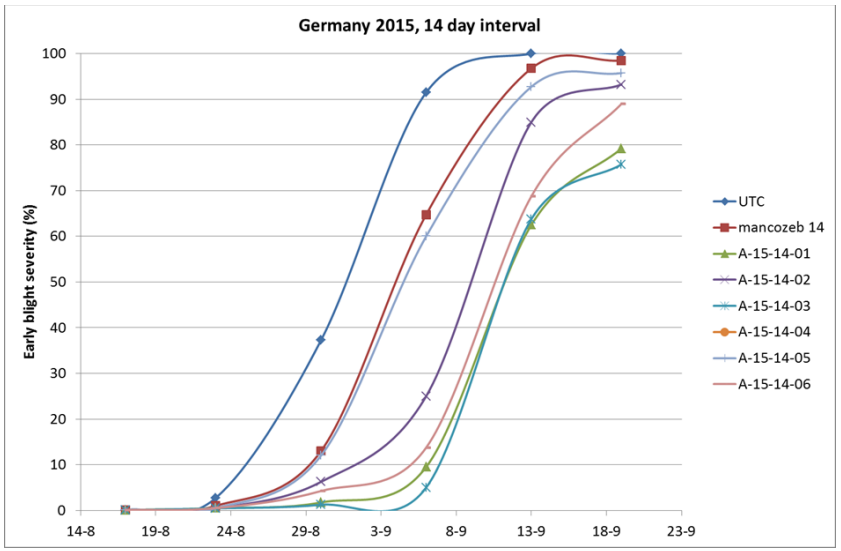
Early Blight epidemic

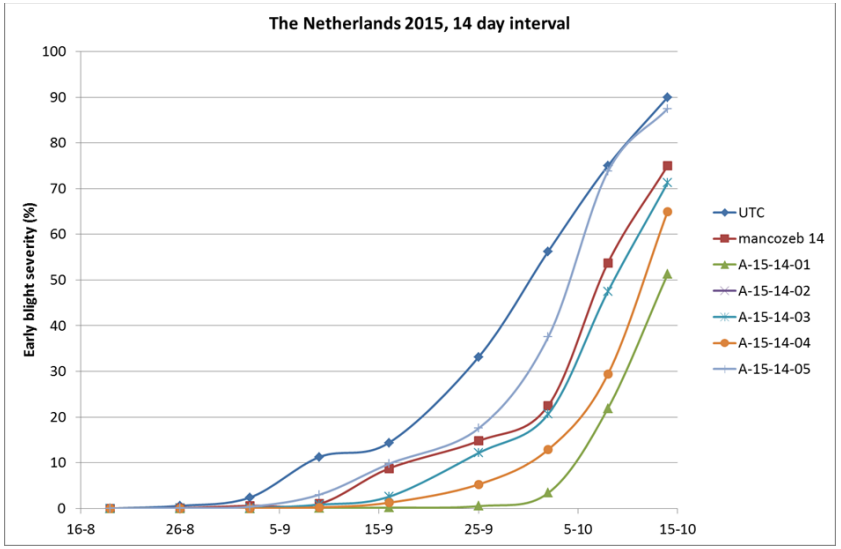
Table 1. First observation of *Alternaria* infected foliage in the untreated control and in treated plots, during the experiments.

	Untreated				Treated			
Year	DK	DE	NL	UK	DK	DE	NL	UK
2015	14-7	15-6	19-8	-	14-7	15-6	26-8	-

Early blight epidemic 14 day interval







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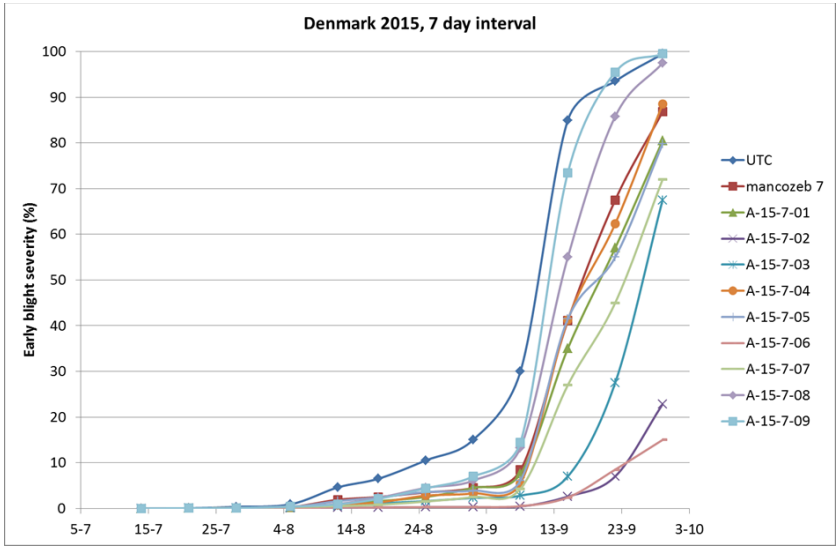
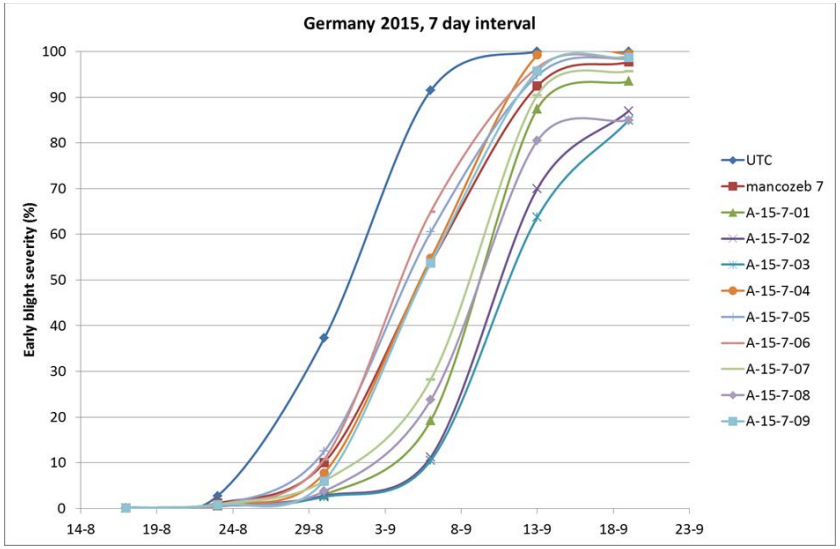
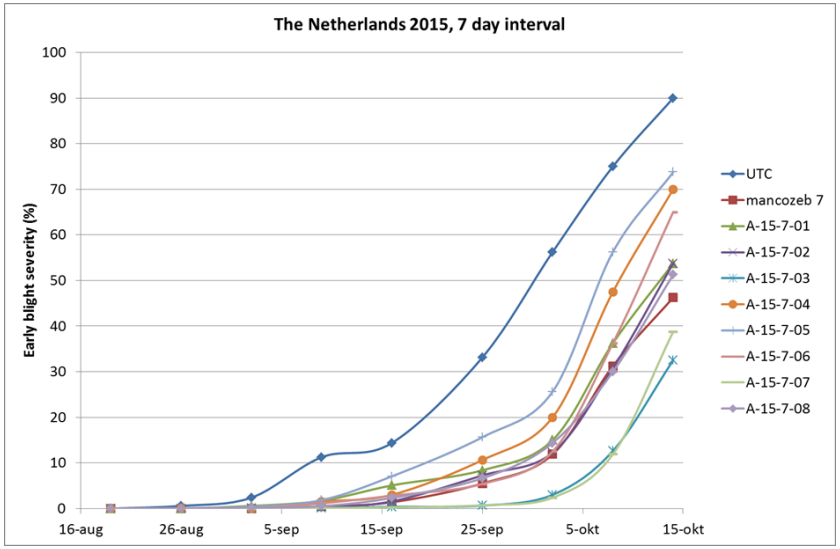
Early Blight epidemic 7 day interval







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Results 14 day interval

Table 1. Early blight disease severity expressed as StAUDPC as a result of fungicides sprayed in a 14 day interval

Fungicide	2015				2016			
	DE	DK	NL	Average	DE	DK	NL	average
A-15-14-01	24.2	0.6	5.6	10.1				
A-15-14-02	34.7	8.5	-	21.6				
A-15-14-03	23.0	1.5	13.5	12.7				
A-15-14-04	-[1]	10.3	9.1	9.7				
A-15-14-05	45.2	-	21.3	33.2				
A-15-14-06	28.0	-	-	28.0				
mancozeb 14	47.7	18.3	16.0	27.3				
UTC	59.7	26.9	27.9	38.2				

[1]: no data available

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Results 7 day interval

Table 1. Early blight disease severity expressed as StAUDPC as a result of fungicides sprayed in a 7 day interval

Fungicide	2015				2016			
	DE	DK	NL	Average	DE	DK	NL	average
A-15-7-01	33.3	13.6	10.7	19.2				
A-15-7-02	27.2	2.1	8.9	12.7				
A-15-7-03	25.4	7.0	3.6	12.0				
A-15-7-04	45.1	14.7	13.3	24.4				
A-15-7-05	46.2	14.0	16.5	25.6				
A-15-7-06	47.1	1.8	10.1	19.7				
A-15-7-07	36.8	10.7	3.8	17.1				
A-15-7-08	32.0	19.7	9.0	20.3				
A-15-7-09	43.6	22.6	-[1]	33.1				
mancozeb 7	43.8	15.7	8.2	22.6				
UTC	59.7	26.9	27.9	38.2				

[1]: no data available

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REML

Table 1. Effectiveness of fungicides to control early blight

Fungicide + spray interval	Active ingredient	Dose rate Kg or L /ha	StAUDPC[1]	decimal rating[2]	
				Current[3]	proposed[3]
A-15-14-01[4]	-	-	10.1[1]	-[5]	-[5]
A-15-14-02	-	-	17.2	-	-
A-15-14-03	-	-	12.7	-	-
A-15-14-04	-	-	18.4	-	-
A-15-14-05	-	-	28.9	-	-
A-15-14-06	-	-	10.6	-	-
mancozeb 14	mancozeb[6]	1.5	27.3	-	-
UTC	-	-	38.2	-	-
A-15-7-01	-	-	19.2	-	-
A-15-7-02	-	-	12.7	-	-
A-15-7-03	-	-	12.0	-	-
A-15-7-04	-	-	24.4	-	-
A-15-7-05	-	-	25.6	-	-
A-15-7-06	-	-	19.7	-	-
A-15-7-07	-	-	17.1	-	-
A-15-7-08	-	-	20.3	-	-
A-15-7-09	-	-	28.7	-	-
mancozeb 7	mancozeb	1.5	22.6	-	-
UTC	-	-	38.2	-	-

[1] : Value established by REML Analysis

[2] : Decimal ratings based on a minimum of 6 experiments. Currently only three experiments have been carried out: DE 1; DK 1 and NL 1.

[3] : The ratings are intended as a guide only and will be amended in future if new information becomes available.

[4] : Fungicides were not tested in each experiment; for details see Materials & Method and Appendix 2.

[5] : No new data available

[6] : dose rate of mancozeb active ingredient.

Outlook 2016

- Three experiments
  - DK, DE, NL
- Set up comparable to 2015
- End of 2016 complete data set
- Calculation of ratings
  - Calculation comparable to late blight calc.
  - 0-5 scale
  - Two categories

Thank you for your attention

Remarks ?