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Late blight control and development in 2014 to NIRDPSB Brasov including technological elements

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National Institute of Research and Development for Potato and Sugar Beet Brasov – ROMANIA

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Introduction.

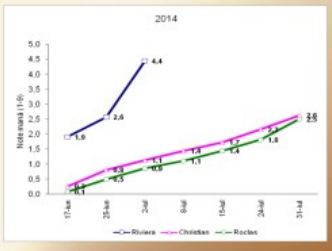
The research aim is to establish the density possibilities and late blight control in Riviera, Christian and Roclas varieties, grown without irrigation in the context of climate change. The main objective of the research is linked to highlight the complementary aspects that accompany chemical control of late blight. At present there is an impression, unjustified, that the treatments solve problems without due attention to cultural hygiene, agro – technical elements (density, weeds etc.).

Materials and methods

- Location of the field trial: NIRDPSB Brasov
- Size of plots: 25 m2
- Lay out of the plots of the field trial: randomized complete block design with 4 replicates. Planting was made in 31st March 2014. Cultivation and maintenance was in line with current good agricultural practice
- Potato cultivars: Riviera, Christian and Roclas
- First symptom of late blight observation: daily check for all plots after emergence till first symptom observed in one of the plots (2014, June 17th) Late blight assessment: plots are assessed for the extent of blight spots on the leaves. Each plot is assessed as a whole for percentage disease severity using a standard accepted severity key.
Yield assessment: two rows in the center of each plot were harvested mentioned the number and the weight of tubers with blight (blighted tubers assessments are usually based on a sample of 100 tubers per plot. When is necessary the tubers are cut to examine the flesh.)

No.	Day	TECH 1 Product	TECH 1 Product	Dose /ha	TECH 2 Product	TECH 2 Product	Dose /ha
1	17.06.	Dithane M-45	Mancozeb 80%	2,5 kg/ha	Ridomil Gold Mz 68 WG	Mefenoxam 45 + mancozeb 643%	2,5 kg/ha
2	25.06.	Bravo 500 SC	Clorotalonil 500 g/l	2,0 l/ha	Consent 450 SC	Fenamidon 75 g/l + mancozeb 375 g/l	2,0 l/ha
3	2.07.	Electis 75 WG	Mancozeb 68,5% + zoxamide 8,8%	1,8 kg/ha	Drago 76 WP	Cymoxanil 6% + mancozeb 70%	2,0 kg/ha
4	8.07	Bravo 500 SC	Clorotalonil 500 g/l	2,0 l/ha	Revus 250 SC	Mandipropamid 250 g/l	0,6 l/ha
5	15.07	Folpet 80 WG	Folpet 80%	2,0 kg/ha	Acrobat Mz 90/600 WP	Dimetomorf 9% + mancozeb 60%	2,0 kg/ha
6	24.07	Shirlan 500 SC	Fluazinam 500 g/l	0,4 l/ha	Bravo 500 SC	Clorotalonil 500 g/l	2,0 l/ha
7	31.07	Shirlan 500 SC	Fluazinam 500 g/l	0,4 l/ha	Shirlan 500 SC	Fluazinam 500 g/l	0,4 l/ha

Evolution of foliage destruction



Results and disscusions

Media effects of control technologies regarding late blight attack to different varieties (Brasov, 2014)

Variety	Late blight control technology	Late blight intensity 17 June*	25 June*	2 July*	8 July**	15 July**	24 July**	31 July**
Riviera	Tech 1	2,3 a	2,9 a	5,0 a	-	-	-	-
	Tech 2	1,5 b	2,2 b	3,9 b	-	-	-	-
Roclas	Tech 1	0,4 c	1,1 c	1,4 c	1,7 a	2,1 a	2,6 a	3,0 a
	Tech 2	0,1 d	0,5 e	0,8 d	1,2 b	1,4 c	1,7 c	2,3 b
Christian	Tech 1	0,1 d	0,9 d	1,3 c	1,6 a	1,8 b	2,3 b	2,9 a
	Tech 2	0,0 d	0,1 f	0,5 d	0,6 b	1,1 d	1,4 d	1,8 c
Mean	Tech 1	1,6	1,9	2,9	0,9	1,6	2,6	2,6
	Tech 2	0,9^{O}	1,2^{O}	2,0^{O}	0,5^{O}	0,9^{O}	1,7^{O}	1,6^{O}
DL 5% (Trat) =		*0,1	*0,1	*0,2	**0,1	**0,1	**0,1	**0,2
LSD 5% (Sol * Trat) =		*1,1	*0,2	*0,4	**0,2	**0,2	**0,2	**0,3

Control technology Tech 2 was more effective to the analyzed varieties throughout the period the attack intensity was lower. At the beginning of the observations, in 17 June the thickening on the row result in a significant intensity of attack only to Riviera variety. To Roclas and Christian varieties did not find significant differences of attack intensity during the observations.

Average interaction effects of late blight control technologies with the planting distances (Brasov, 2014)

Planting distance cm	Late blight control	Yield Riviera T/ha	Riviera Test Duncan	Roclas T/ha	Roclas Test Duncan	Christian T/ha	Christian Test Duncan	Mean T/ha	Mean Test Duncan
30	Tech 1	18,4	FF	24,8	BC	23,9	BC	22,4	B
	Tech 2	18,8	EF	26,8	A	26,2	B	24,6	A
25	Tech 1	16,8	F	23,1	CD	22,5	C	20,8	C
	Tech 2	20,6	DE	24,6	BC	24,4	B	23,2	AB
Average									
30 cm		18,6	C	26,8	A	25,1	AB	23,5	100 %
25 cm		18,7	C	23,9	B	23,4	B	22,0	93,6%
Tech 1		17,6	E	23,9	BC	23,2	C	21,6	100 %
Tech 2		19,7	D	26,7	A	25,3	AB	23,9	110,6%
Variety /experience		18,6	100%	25,3	136,0%	24,2	130,1%	22,7	CV = 7,2 %

DL 5% (Variety) = 8 t/ha (42,8%)
DL 5% (Distance) = 1,1 t/ha (4,5%)
DL 5% (Treatment) = 0,7t/ha (3,2%)
LSD 5% (Variety * Dist) = 2,6 t/ha
LSD 5% (Variety * Trat) = 1,7 t/ha
LSD 5% (Dist * Treat) = 1,4 t/ha
LSD 5% (Variety * Dist * Treat) = 2,4 t/ha

Average of total yield was 22.7% (CV = 7,2 %).
Average yield were 18.6 t/ha (100%) to Riviera, 25,3 t/ha (136,0%) to Roclas and 24,2 t/ha (130,1%) to Christian. Although Roclas and Christian yield exceeded Riviera with 36.0% and 30.1%, the differences were not statistically significant.
To the 25 cm distance plants density were more frequent and total production was reduced on average by 6.4%, densities effects manifested significant only to Roclas variety
By applying Tech 2 total production increased by 10.6% compared to the average production achieved after Tech 1.
Significantly better effects on average total production of Tech 2 occurred in all varieties studied and averaged over both densities.
Varieties responded differently to interaction between density and late blight treatment.

Conclusions:

- Riviera variety leaves little freedom protection, so the fight should begin as soon as the amount of inoculum in the medium is able to produce a general infection (after observing symptoms on leaves detached).
- The other two varieties, Christian and Roclas allow a reduction in the number of treatments.
- Reducing numbers of applications or reducing the amount of active substance used in treatment, or delaying the application of the first treatment, it can make a saving of one to three treatments at the beginning of the season.
- To Riviera and Christian varieties positive effects on production Tech 2 occurred significantly only when planting was done to turn higher density, at a distance of 25 cm. To Roclas variety yield differences are higher at the distance of 30 cm between Tech 2 and Tech 1.
- The biggest yield (28.8 t/ha) was achieved to Roclas variety using Tech 2 and a distance between rows 30 cm.

EuroBlight

A potato late blight network for Europe

BRASOV - ROMANIA 13-15 MAY 2015

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Preface

EuroBlight Workshop Brasov, Romania 10-13 May 2015

A European network of scientists and other specialists working on potato early and late blight meet every 2nd year. The network combines two previous networks originating from European Concerted Actions and has 150 members.

- EU.NET.ICP: "European network for development of an integrated control strategy of potato late blight" (1996-2000). Coordinated by Huub Schepers.
- EUCABLIGHT: "A potato late blight network for Europe" (2003-2006). Coordinated by Alison Lees.

The 15th Workshop was hosted by the National Institute for Research and Development for Potato and Sugar Beet. The Workshop was attended by 103 persons from 22 countries, including Russia, Chile, Argentina, China, Israel and USA. Representatives from all countries presented recent research results regarding integrated control, decision support systems, resistance of varieties, late blight in organic potatoes and population biology of the late blight pathogen in potatoes. Since early blight is an increasing problem in Europe reports on this disease are also included.

The papers and posters presented at the Workshop and discussions in the subgroups are published in these Proceedings, PPO-Special Report no. 17. The current and previous Proceedings are also available on the EuroBlight website www.EuroBlight.net.

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