

Late blight control in the specific conditions of Bârsa Land, Romania

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Introduction:

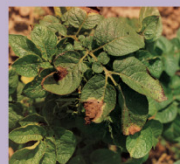
Integrated late blight control supposed to use cultural, biological and chemical measures. The aim is to use techniques at the right time without completely destroy of the disease, ensuring control methods to protect the environment and useful organisms. Therefore, between 2010-2011, two potato fields were setup with the purpose to evaluate and compare the efficacy of different fungicides used in Romania for potato late blight control.

Agronomic measures:

- Phyto -sanitary care represents a complex with prophylactic character to avoid the infection and to prevent the spread of the disease on an epidemic level.
- Eliminated tubers from sorting process represent a dangerous source of infection because the fungus produces spores and infected plants appears just when potato plants are raising up.
- Cultural methods are looking to provide normal and vigorous development of potato crops.
- Attentive selection of tubers, sprouting, planting in optimal time, correct fertilization, maintenance in time provided a normal development of plants and make shorter the favorable periods for disease attack.
- Unbalance fertilization, especially with nitrogen determine huge foliage, proper for late blight attack.
- Maintenance and protection against other diseases and Colorado potato beetle are important because stressed plants are sensitive to late blight.
- Weeds are in permanent concurrence with potato for all environmental factors. Their excessive foliage development reduces air currents making humid periods longer and increases the chance for late blight appearances.
- Vine killing in the case of diseased potato crops is a measure to reduce the frequency of tuber attack.
- To stop the late blight cycle on potato crops are recommended chemical products for haulm destruction.

Field trial methods

Year	2010	2011
Variety	Sante	Sante
Sowing date	26 April	13 May
Experimental design	Complete randomized block design (4 replicates)	
Plot size (m ²)	25	25
Spray equipment	Knapsack sprayer	
Harvest date	14 September	22 September



Field trials results

2010

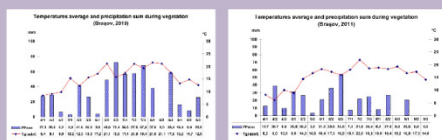
Plot	Foliar late blight (%)								Yield (t/ha)	Tuber blight (%)
	Start June 17	Start June 28	Start July 8	Start July 19	Start July 29	Start Aug 8	Start Aug 18	Start Aug 28		
Untreated	18.5	18.2	38.9	33.0	50.9	64.6	87.0	22.7	5.3	
No. 1	2.0	2.8	3.3	3.8	5.2	6.2	9.8	36.5	1.5	
No. 2	2.3	3.1	2.8	4.2	5.6	6.3	8.8	37.6	1.8	

2011

Plot	Foliar late blight (%)								Yield (t/ha)	Tuber blight (%)
	Start June 16	Start June 26	Start July 6	Start July 16	Start July 26	Start Aug 5	Start Aug 15	Start Aug 25		
Untreated	1.8	3.0	10.0	20.0	30.0	42.0	58.0	71.0	2.8	
No. 1	0.0	0.0	2.0	3.0	3.0	4.0	4.0	10.0	0.3	
No. 2	0.0	0.0	3.0	4.0	4.0	5.0	5.0	10.0	0.6	

Climatic conditions

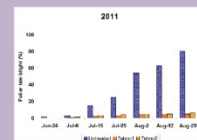
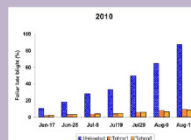
2010 - Epidemic phase of the disease was devastating and quickly installed (late blight apparition July 1st).
 On July and August heavy rains and high temperatures contributed to foliage dying.
 2011 - On June, rains accompanied by high temperatures led to an early late blight appearance. (June, 21th).
 From July to the end of potato growing season rainfall were increasingly reduced, (53.5mm, represented only 39.2% from the multiannual average).



- There are no significant differences between the two treated plots in any assessments.
- On both years, at the end of the growing season, treatments with all fungicide gave significantly (P<0.05) lower level of foliage blight compared with control (untreated) plot.
- The untreated plot (control) presented a high late blight attack.
- On the treated plots the disease evolving slowly due to applied fungicides.
- From the middle of July late blight was in sporulation phase, a difference between treated and untreated plots was noticed, with a higher frequency of attack in untreated plot.
- According to the experimental results the level of late blight on foliage was significantly higher in untreated plot.
- Thus, after two years of experiments, we observed that climatic conditions have a powerful influence on Phytophthora infestans attack on potato crops.
- To control this devastating disease it is necessary an efficient treatments program.

Fungicide spraying program

Plot	Spray 1		Spray 2		Spray 3		Spray 4		Spray 5		Spray 6		Spray 7	
	Product	Dose (g)	Product	Dose (g)	Product	Dose (g)	Product	Dose (g)	Product	Dose (g)	Product	Dose (g)	Product	Dose (g)
1	Untreated (control)													
2	Odson 820 WG	1.0	Elactic 75 WG	1.5	Curate Maxox	2.5	Armetol Cobrel	2.5	Dithane M 45	2.0	Odson 820 WG	1.0	Benjo 500 SC	0.41
3	Armetol M	2.5	Folpan 80 WDG	2.0	Inferno 827 S SC	1.41	Odson 820 WG	1.0	Consept 450 Sc	2.01	Benjo 500 SC	0.31	Benjo 500 SC	0.41



CONCLUSIONS:

Integrated control of late blight is a managerial technique combination to maintain the disease on a low level and in the same time to protect the environment. Integrated control directories are:

- Cultural hygiene to limited the primary infection focus.
- Using resistant varieties to limit late blight attack on foliage and tubers.
- Fungicides apply using forecasting methods (Agroexpert system) and further treatments until harvest at recommended intervals.
- Reduce application intervals (4 maximum 7 days) when the infection pressure is high

Acknowledgement

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