



Plant Breeding and Acclimatization Institute - Radzików
DEPARTMENT OF POTATO PROTECTION
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Effectiveness of some fungicides in control of *Alternaria alternata* and *Alternaria solani*



EARLY BLIGHT - *Alternaria* species

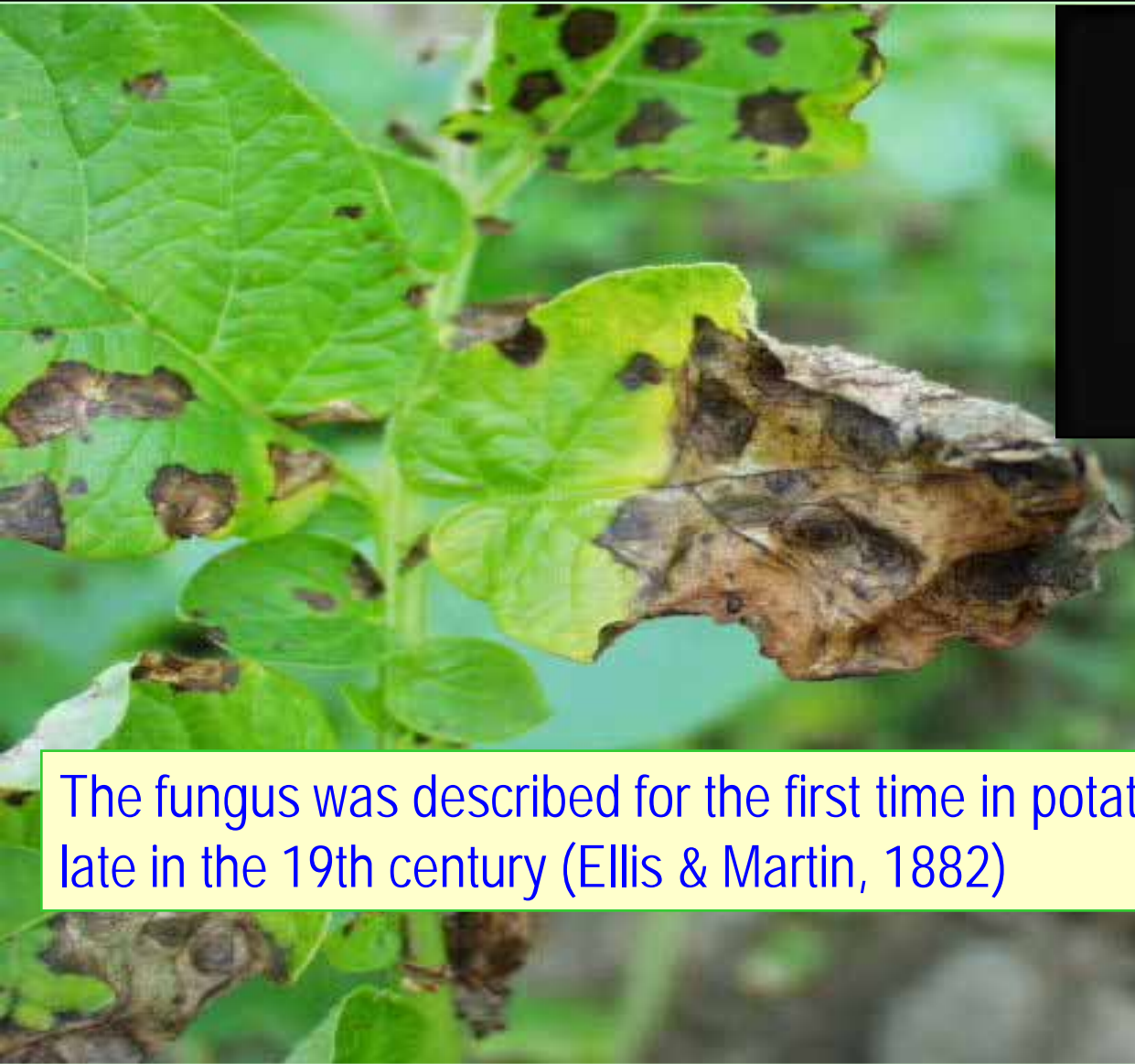


Photo by G. Kleinschmidt.

The fungus was described for the first time in potato - late in the 19th century (Ellis & Martin, 1882)

Losses of the yield due to early blight

First information about losses: **10-32%** (Neergaard 1945)

10-57% (Harrison *et al.* 1965)

SU - **25%**, locally **60%** (Bacanov 1970, Dorożkin 1972)

Average losses in USA **20-30%**

up to **50%** Hadders (2002)

In Brazil losses up to **73%** (Brune, *et al.* 1998)

In South Africa up to **50%** (Denner & Theron 1999)

In Poland **10-32%** (Kuczyńska 1992), **6-45%** (Kapsa & Osowski 2004)




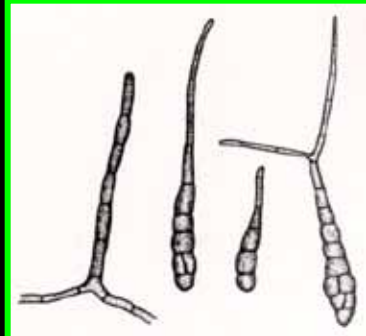

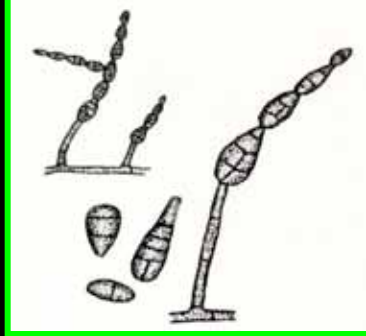
Factors affecting early blight development

- Alternating wet/ dry periods
- Wind borne spores
- Factors influenced on plant weakness.
 - senescing plants
 - soil with low contents of organic matter
 - low nitrogen fertilization
 - other pathogens' infection



Potato plants infected with some viruses are more susceptible to the early blight infection; this refers mainly to viruses PVY, PLRV and PVX

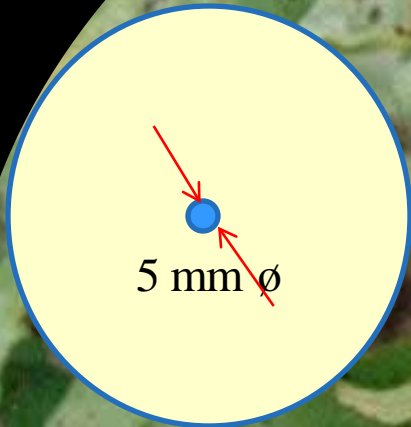
Characteristics of two *Alternaria* species, the casual agents of potato early blight

Fungal species /synonyms	Host plants	Disease symptoms	Optimum temperature - °C*	Spore morphology**
<p><i>Alternaria solani</i> <i>Macrosporium solani</i> <i>A.porri f.sp.solani</i> <i>A.dauci f.sp.solani</i></p>	<p>plants from Solanace without Datura</p>	 <p>Early blight</p>	<p>Sporulation - temp. 26-28°C Mycelium growth & spore germination - 18-22°C</p>	
<p><i>Alternaria alternata</i> <i>A.tenuis</i> <i>Torula alternata</i></p>	<p>about 40 plant species</p>	 <p>Brown leaf spot</p>	<p>Sporulation - temp. 25-26°C Mycelium growth & spore germination - 22-26°C</p>	

Source: * Dorozkin, Bel'skaja 1979

** Hooker 1990

Materials and methods



Treatment	Active substance	Dose kg-l /ha
Untreated control	-	-
Altima 500 SC	fluazinam	0,4
Amistar 250 SC	azoxystrobin	1,0
Antracol 70 WG	propineb	1,8
Ridomil Gold MZ 68 WG	mefenoxam + mzb	2,0
Infinito 678,5 SC	fluopicolide+propamocarb-HCl	1,6
Revus 250 SC	mandipropamid	0,6
Tanos 50 WG	cymoxanil+famoxadone	0,5
Dithane NeoTec 75 WG	mancozeb	2,0
Unikat 75 WG	zoxamide + mzb	2,0

Laboratory conditions: temp. 25°C, RH 90%

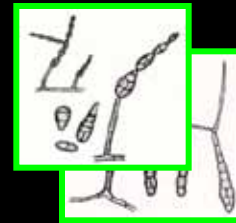
– 10 Petri dishes / fungicide x 2 doses (field dose & 10 x lower)

Criteria of assesment

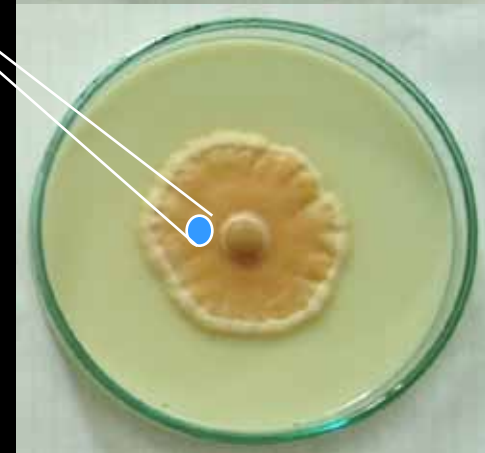


diameter of mycelium - mm

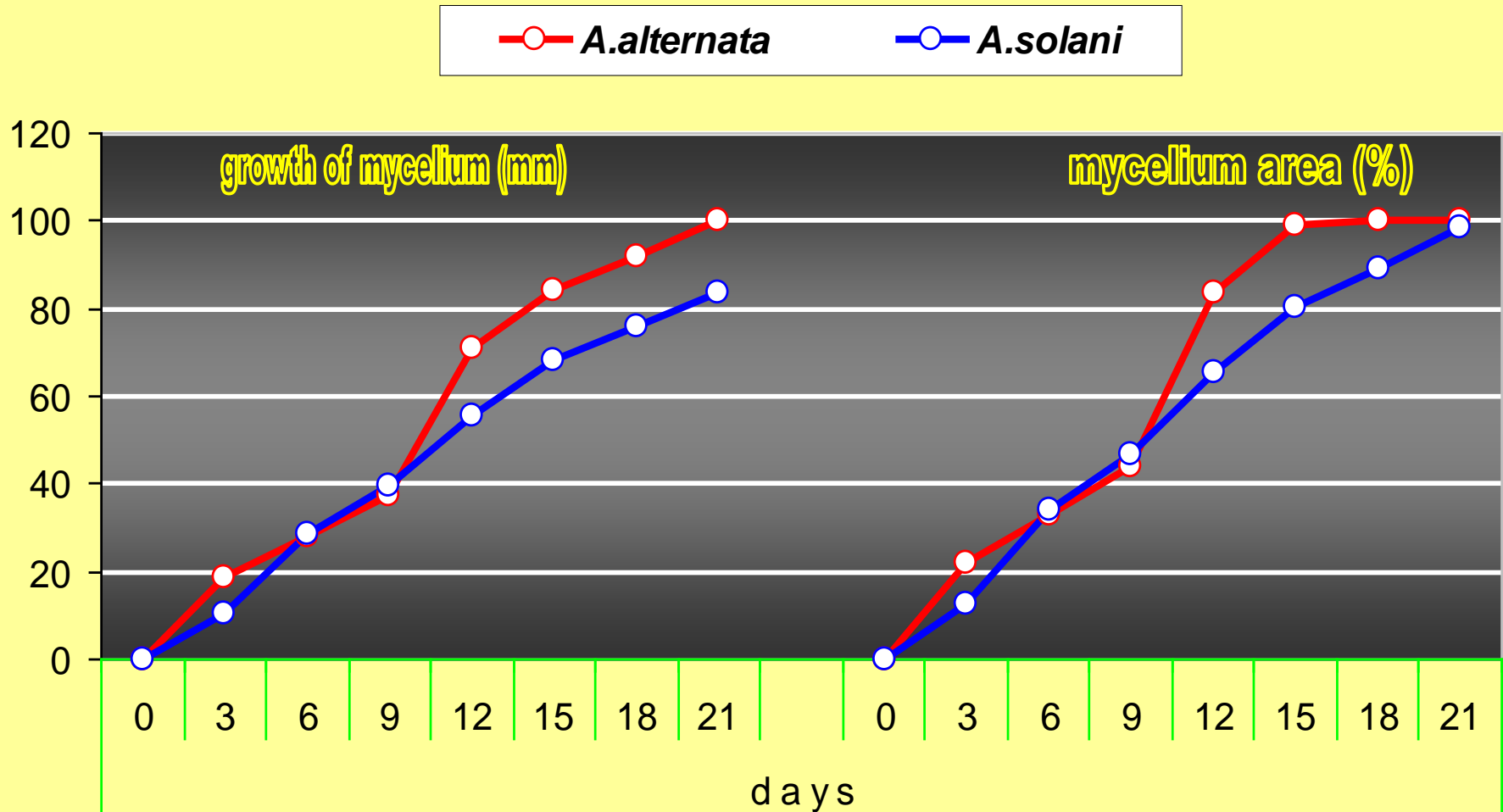
number of spores



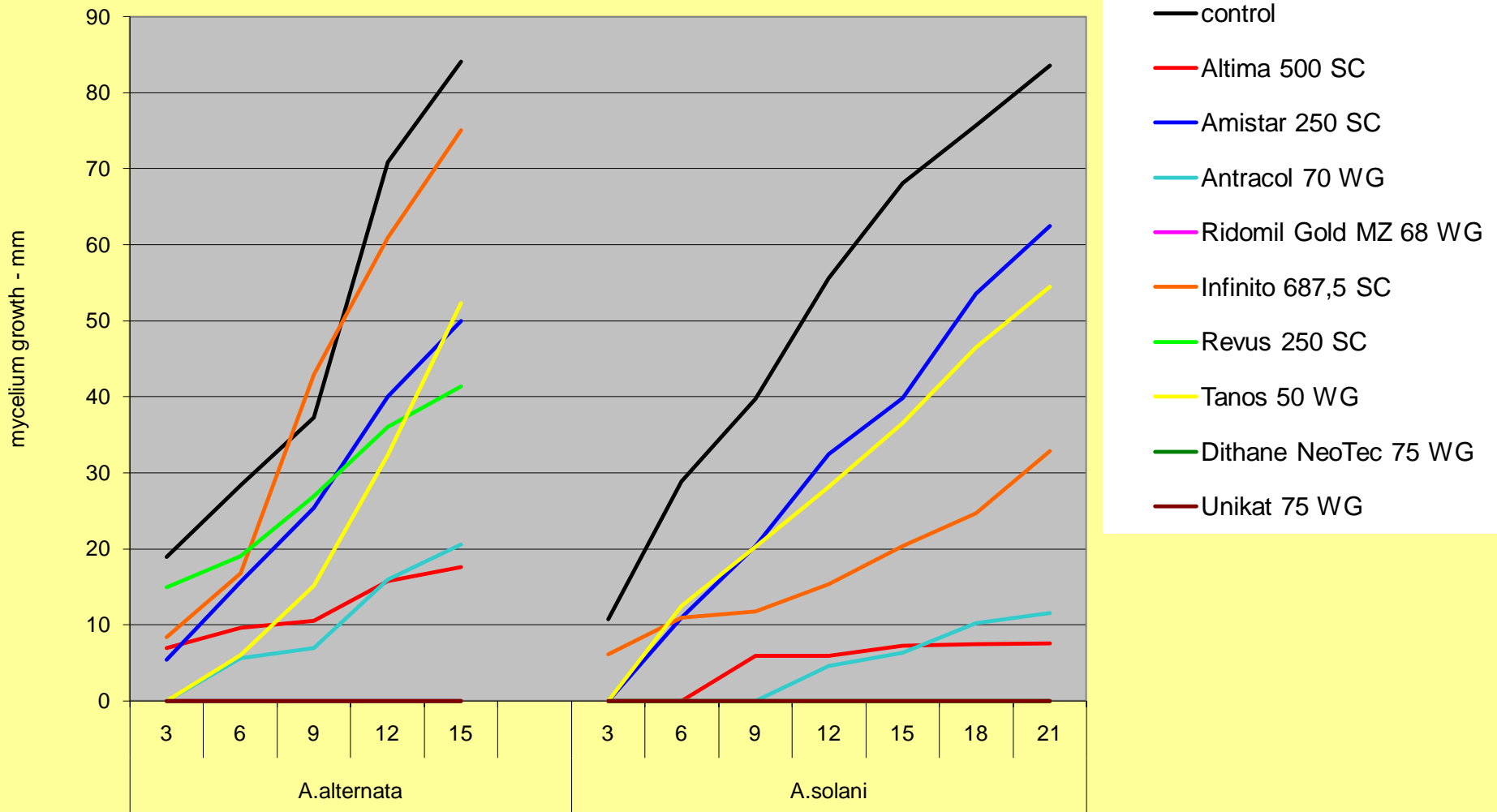
surface of mycelium - %



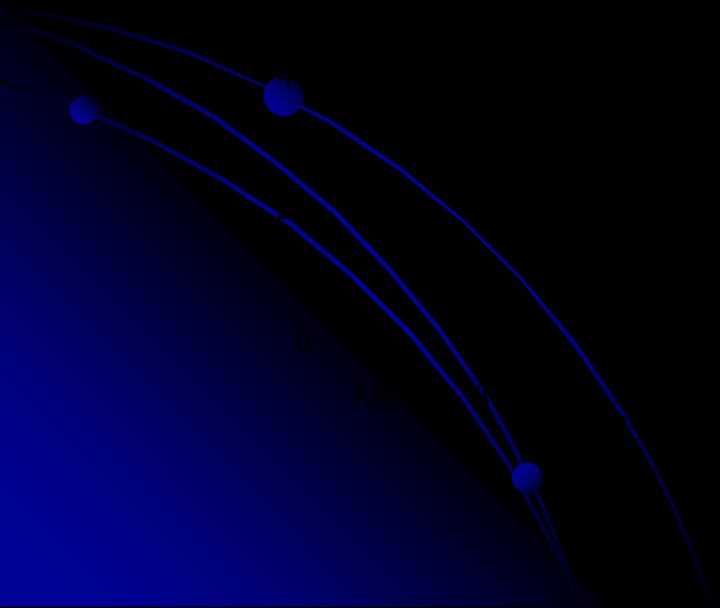
Mycelium development of *Alternaria* spp. on artificial medium



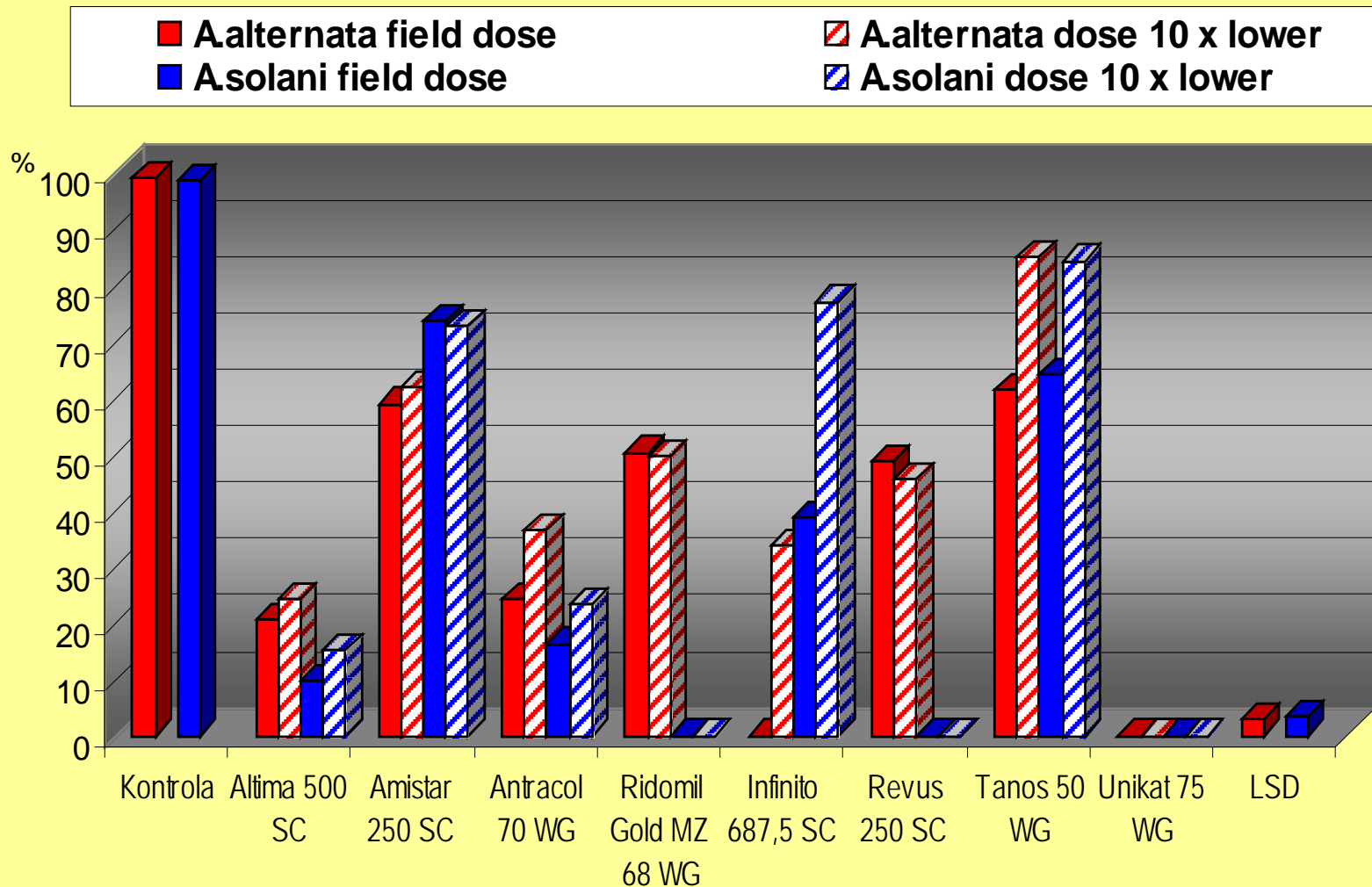
Influence of a fungicide supplement on development of mycelium growth



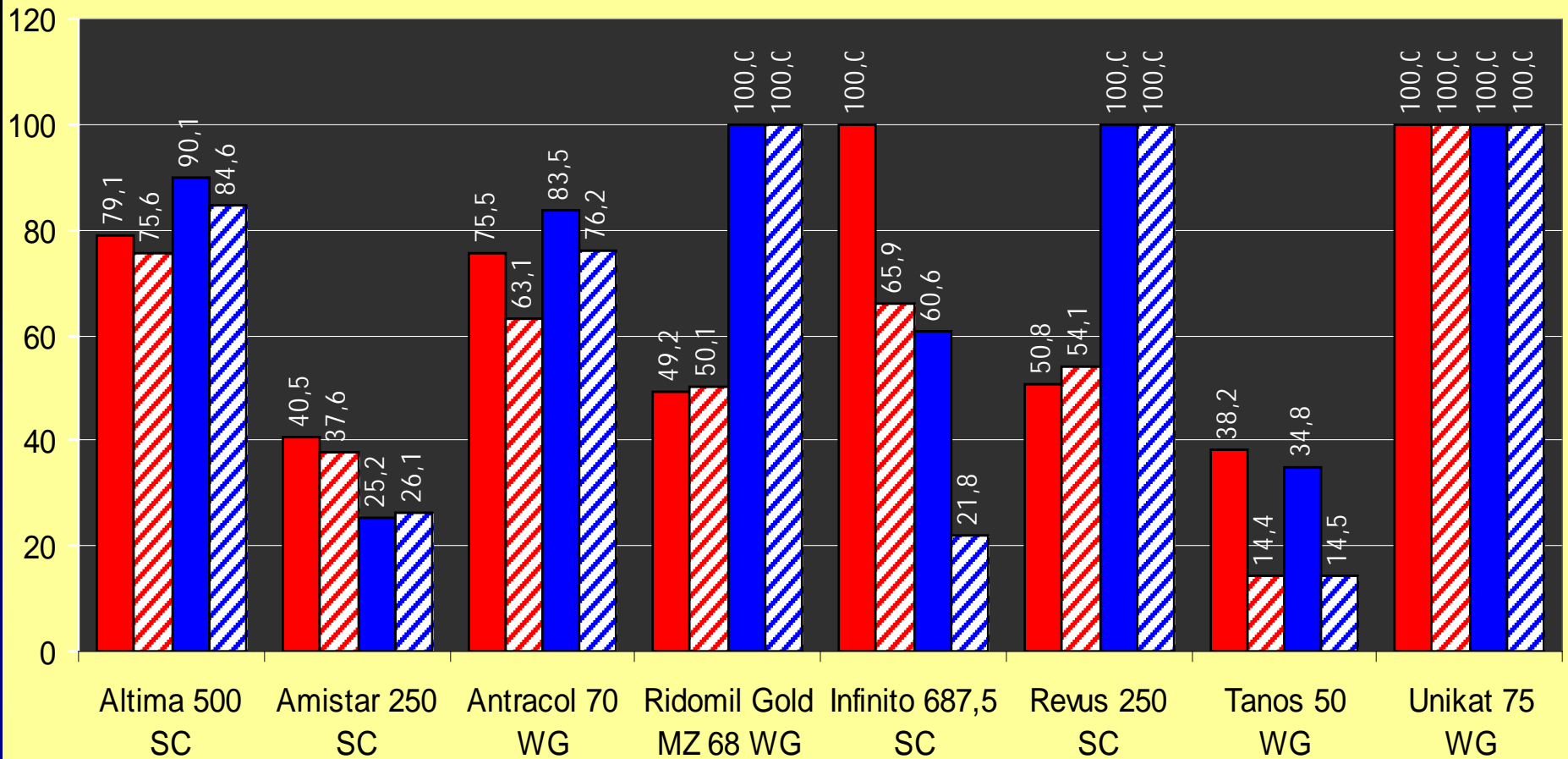
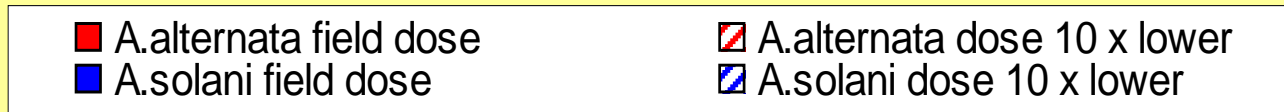
Influence of a fungicide supplement on size (diameter) of *Alternaria* spp. mycelium






Influence of a fungicide supplement on the area of *Alternaria* spp. mycelium

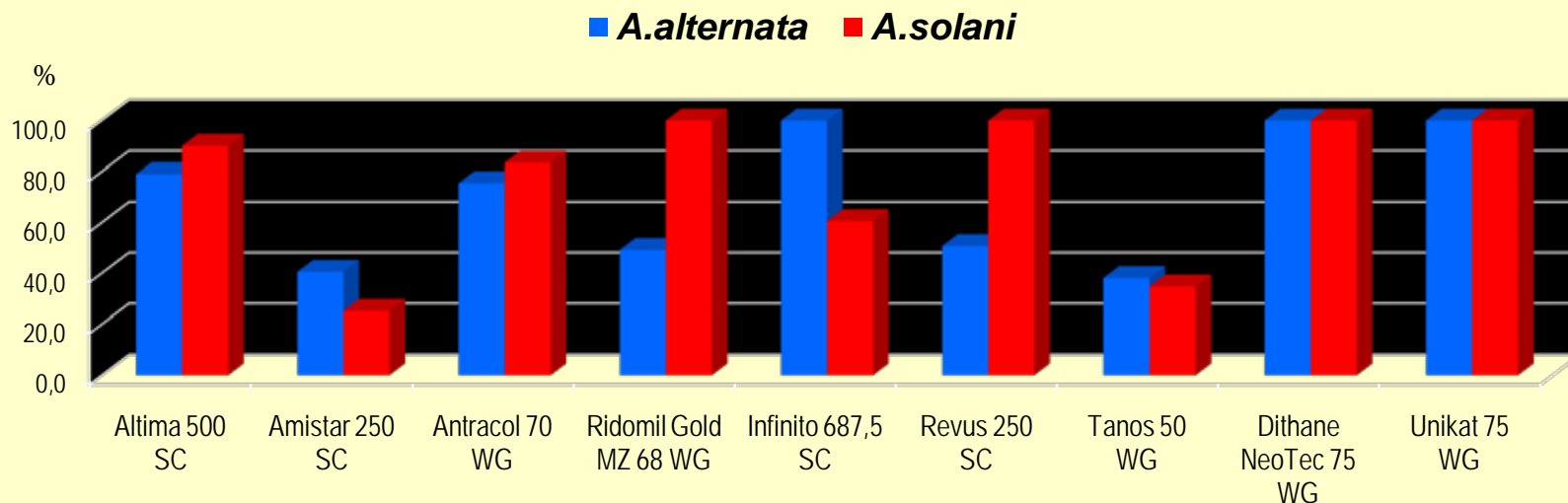


Efficacy of fungicides in inhibition of mycelium growth



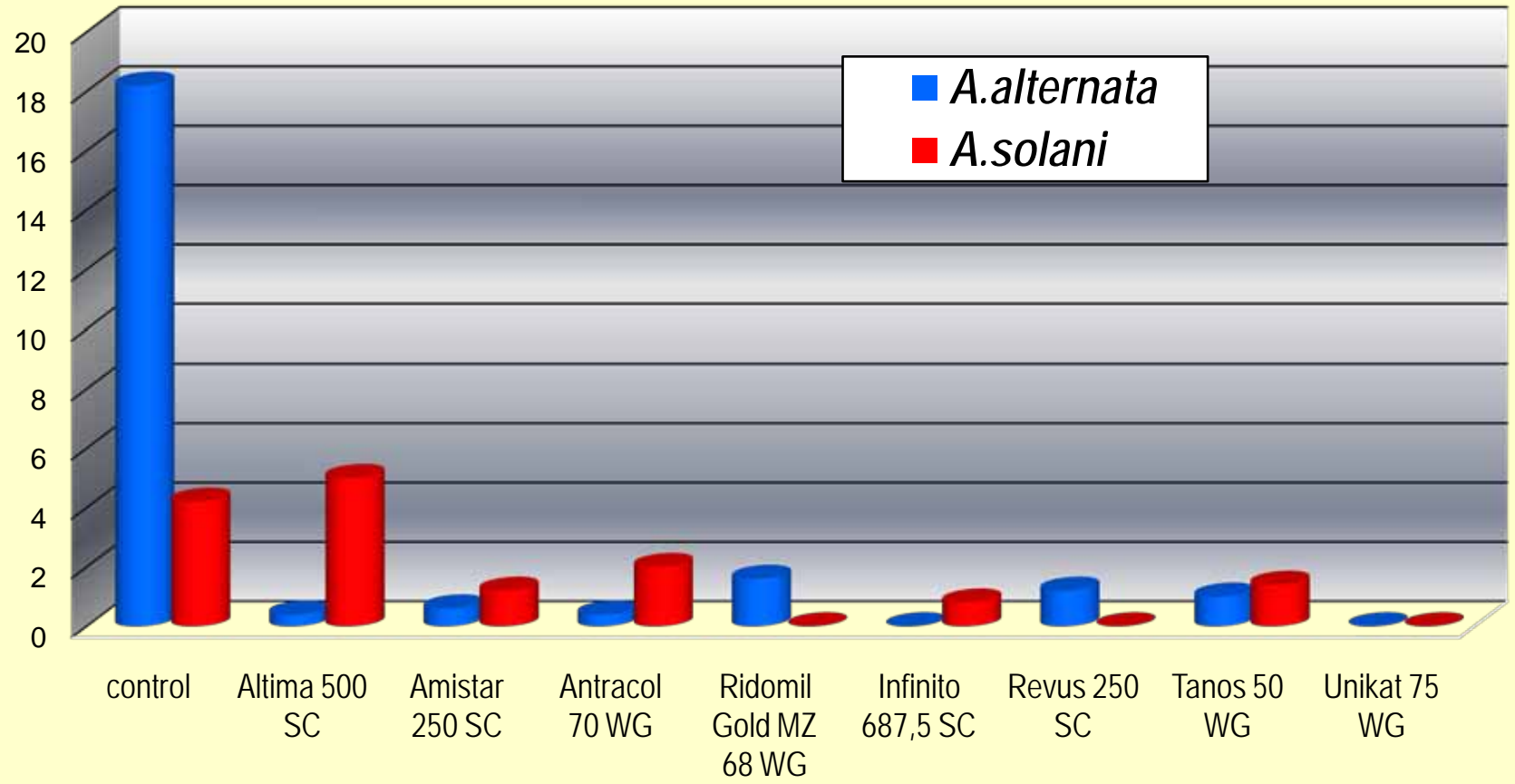
Fungicide effectiveness in inhibition of mycelium growth

Efficacy-%	<i>A. alternata</i>	<i>A. solani</i>
 75,1 - 100	mancozeb; zoxamide+mzb; fluopicolide+propamocarb-HCl; fluazinam; propineb;	mancozeb; mandipropamid; mefenoxam+mzb; zoxamide+mzb; fluazinam; propineb;
 50,1 - 75,0	mandipropamid	fluopicolide+propamocarb-HCl;
 < 50,0	mefenoxam+mzb; azoxystrobine; cymoxanil+famoxadone	cymoxanil+famoxadone; azoxystrobine



Influence of a fungicide supplement on spore density

no of spores



Conclusion

- | Tested fungicides showed differences of efficacy in control of two species of *Alternaria* fungus : *A. alternata* & *A. solani*
- | Some of them inhibited growth of the both species at the same level (mancozeb, zoxamide+mzb, cymoxanil+famoxadone*)
- | A few of fungicides showed better effectiveness in inhibition of *A. alternata* (fluopicolide+propamocarb-HCl, azoxystrobine),
- | Some of them were more effective against *A. solani* (mandipropamid, mefenoxam+mzb, fluazinam*, propineb*)

A wide-angle photograph of a lush green field, likely a crop field, under a clear sky. In the distance, a line of trees and a large, dark-colored barn with a gabled roof are visible. The text "Thank you for your attention" is overlaid in the center of the image in a bold, yellow font with a blue outline and a slight shadow effect.

Thank you for your attention