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The role of soil temperature and soil water content in root infection of potatoes by Spongospora subterranea f.sp. subterranea

Contents	
• Introduction	
• Aim	
• Method	
• Discussion points	
• Conclusion	

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Introduction

South African potatoes are particularly at risk of late blight, the most serious potato disease, due to climatic conditions. Spongospora disease, which has been found in other countries, affects the roots in South Africa. It is a fungal infection of the root system, and it causes the plant to wilt and die.

Aim

- To study the effect of temperature as well as soil water on the infection of potatoes by *S.s.* in South Africa, respectively.
- To differentiate between the different stages of development of the disease as a response to ranges of temperature and soil water.

Method

- Preparation of inoculum
- Temperature per trial
- Soil water content trial



Discussion points

- Questions surrounding the temperature per trial
- Questions surrounding the soil water content trial
- Initial gradients of water to use to simulate the three different regions intended
- The type of soil will impact on the water holding capacity as well as wilting point and saturation period

- Creating a uniform temperature gradient across all pots
- Day/Night temperature fluctuations
- Internal pot temperature deviations from the greenhouse artificial environment

Conclusion

There is a great economical as well as global interest to study the ranges of temperature and soil water content that affects powdery scab in South Africa. This could lead to further understanding of the disease, leading to possible local conditions that will provide minimal infection rates.

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- Aim
- Method
- Discussion points
- Conclusion

Introduction

South African conditions were once believed to be unfavourable for Spongospora subterranea (Sss)

Numerous studies suggest what the predominant conditions are for powdery scab

However occurrence of the disease has been found in almost opposite climactic regions in South Africa

It is therefore imperative to conduct temperature and moisture trials in South Africa with samples of this disease

Aim

- To study the effect of temperature as well as soil water on the infection of potatoes by Sss in South Africa, respectively
- To differentiate between the different stages of development of the disease as a response to ranges of temperature and soil water

Method

- Preparation of inoculum
- Temperature pot trial
- Soil water content trial



- Apply exactly 5kg of inoculated soil to pots (and uninoculated controls)
- Temperature range: 10C, 20C, 30C
- Water schedule
- 10 reps, RCBD
- Root gall testing
- Tuber blemish testing

Method

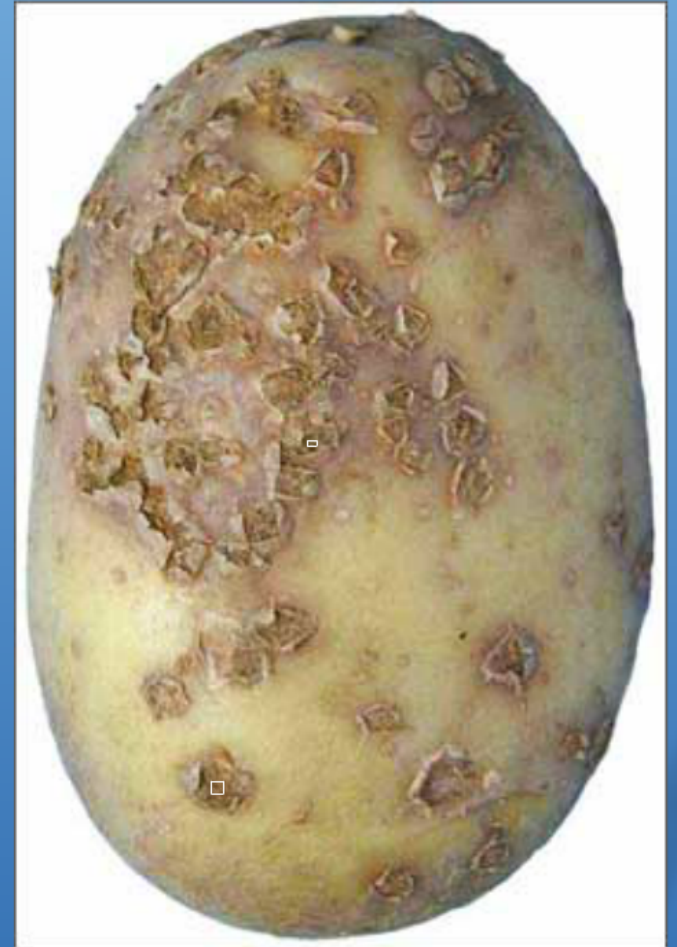
- Preparation of inoculum
- Temperature pot trial
- Soil water content trial



- 5kg pots will be used again and prepared exactly like the previous temperature trial
- Incubate at a standard 25 C
- With 3 soil water regimes (Wilting point, saturation point and fluctuating water content)
- Water content calculated by soil physics methods and by weighing the pots before and after watering

Method

- Preparation of inoculum
- Temperature pot trial
- Soil water content trial



Discussion points

- Questions surrounding the temperature pot trial



- Questions surrounding the soil water content trial



- Creating a uniform temperature gradient across all pots



- Day/Night temperature fluctuations



- Internal pot temperature deviations from the greenhouse artificial environment

Discussion points

- Questions surrounding the temperature pot trial



- Questions surrounding the soil water content trial



- What gradients of water to use to simulate the three different regimes intended
- The type of soil will impact on the water holding capacity as well as wilting point and saturation period

Conclusion

There is a great economical as well as global interest to study the ranges of temperature and soil water content that affects powdery scab in South Africa.

This could lead to further understanding of the disease, leading to possible local conditions that will provide minimal infection rates