

Seed Treatment and Fungicide Applications to Control Stem Blight on Potato

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Introduction



Fig. 1: Stem blight

- *Phytophthora infestans* is often brought to the field by latent infected potato seed tubers
- Pathogen grows and sporulates on tubers at high soil moisture after rainfall
- Spread of sporangia via soil water causes stem blight on neighbouring plants
- The precise onset of the first infection steps can not be calculated yet

Aim: Reduction of stem blight and spread of the disease independent from date of epidemics onset

Materials und Methods



Fig. 2: Inoculation of seed tuber with *P. infestans*

23 field trials were carried out with seed tubers inoculated by injection of zoospores (Figure 2). Either a single tuber was used or an inoculated tuber was planted adjacent to a healthy one.

To reduce primary stem blight, tubers were treated with 120 g copper/ha (copper hydroxide; trade name: Cuprozin flüssig) or 2.0 kg/ha of a systemic fungicide (Metalaxyl M + mancozeb; trade name: Ridomil Gold) prior to planting. In a third approach the systemic fungicide was applied to plants in the field (2.0 kg/ha) when *Phytophthora* was positively detected in stems via Polymerase Chain Reaction (PCR).

Results

Copper seed treatment nearly equally often led to a high effect (reduction of stem blight >50%), a moderate effect (reduction of stem blight between 10 and 50%) and a low effect (reduction of stem blight <10%).

A seed treatment with a systemic fungicide caused a high effect in 52% of all experiments and a moderate effect in 39%. A low effect only occurred in 9% of the experiments.

An early field application of the systemic fungicide led to a reduction of stem blight >50% (high effect) in 70% of all experiments, while no low effect occurred (Figure 3).

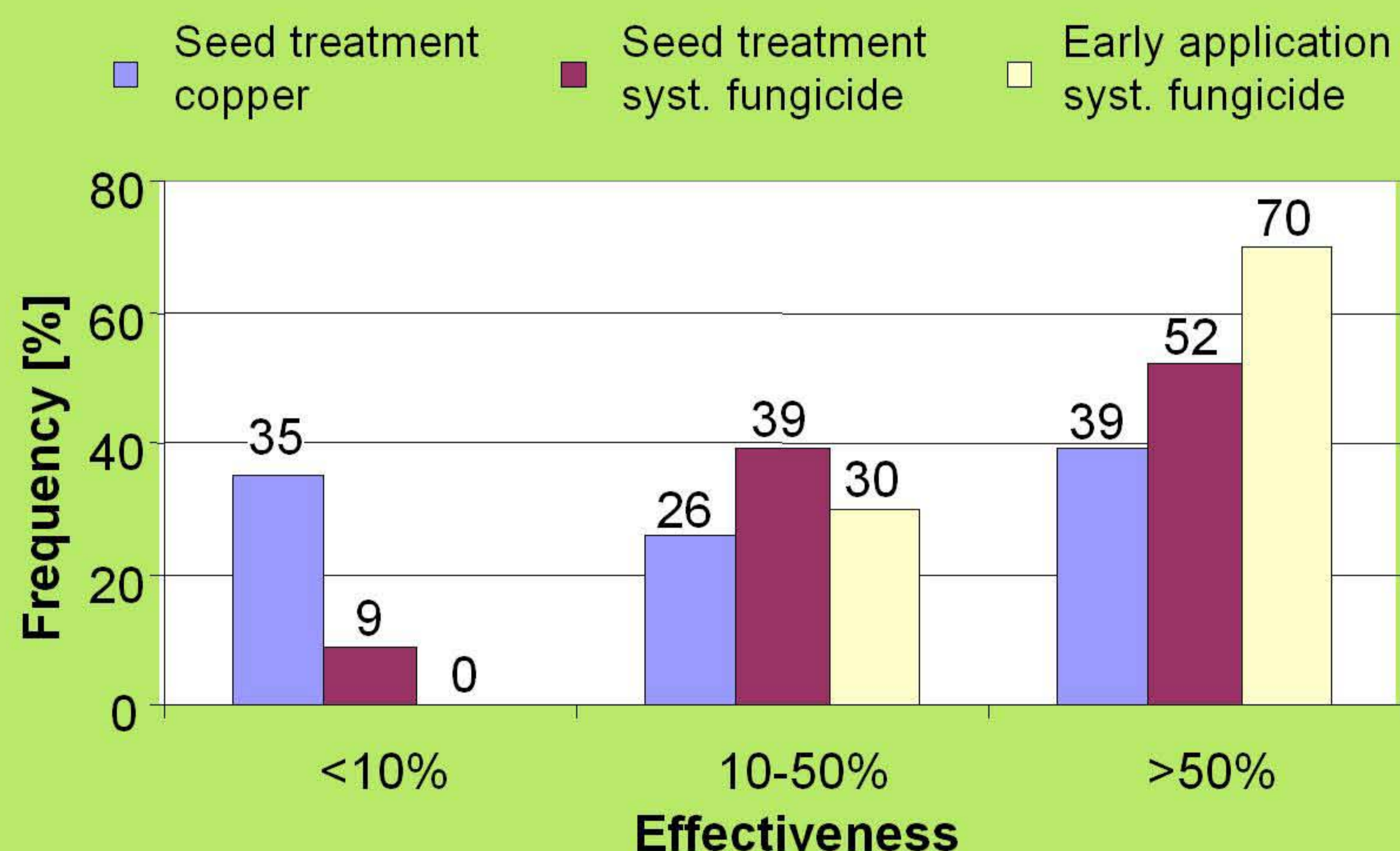


Fig. 3: Comparison of the effectiveness of protective measures in 23 field trials.

The average reduction of stem blight by a copper seed treatment was 34%, and 54% with a systemic fungicide seed treatment. The highest reduction of 65% was achieved by the early field application of a systemic fungicide (Figure 4).

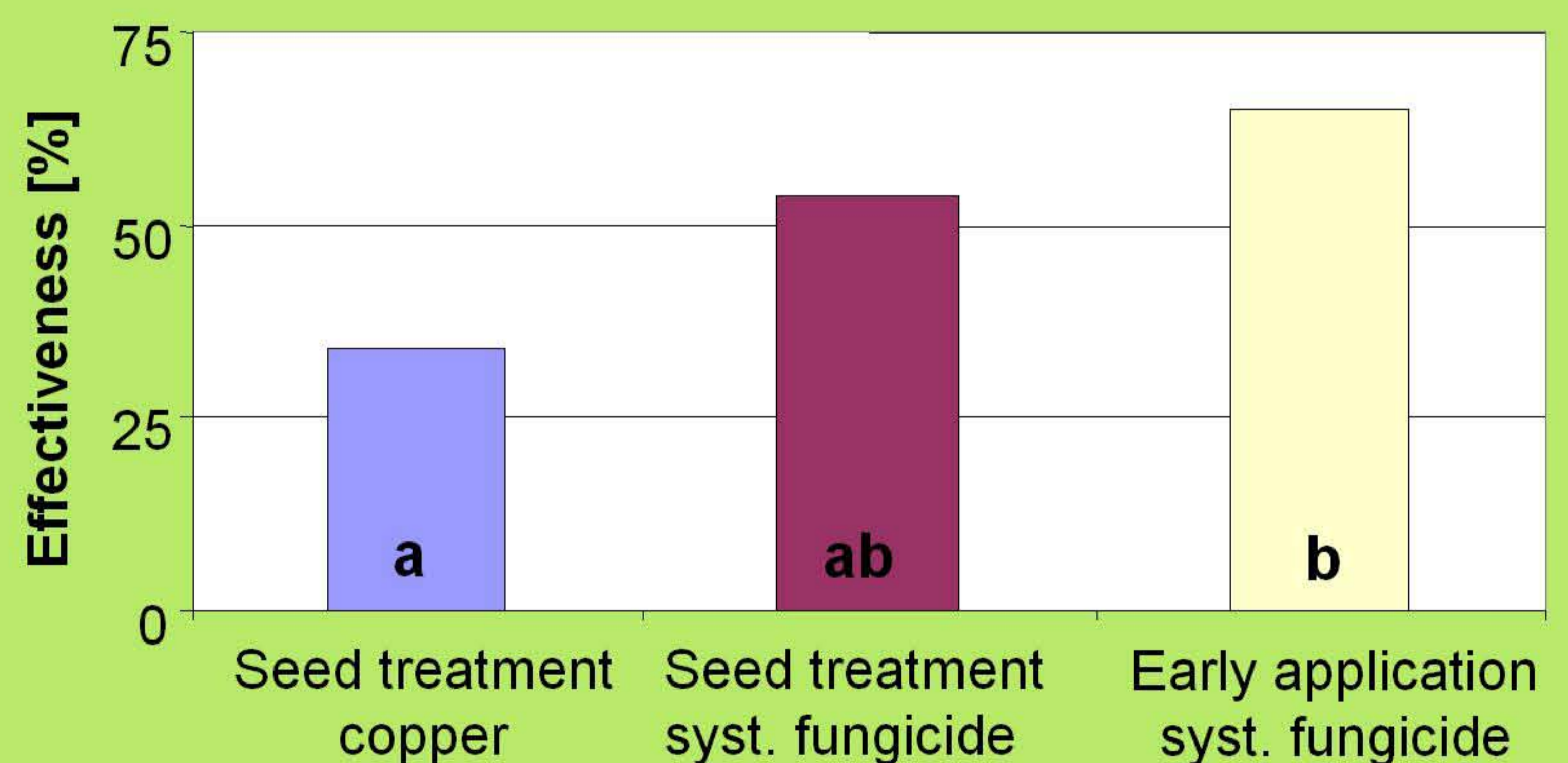


Fig. 4: Average effectiveness of protective measures to prevent stem blight. ($p < 0.05$)

Summary

- Best control of stem blight was achieved by early application of systemic fungicide
- Seed treatments also reduced stem blight, with a systemic fungicide being more effective than a copper treatment
- By combining a seed treatment with an early fungicide application a farmer can obtain effective stem blight management