

## Field Experiment Report 2006

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Potato scab diseases are caused by several species of *Streptomyces* that inflict severe damage. This disease has intensified recently, especially in the Ma'on region. Its increased prevalence and especially severe symptoms in this region is attributable to several factors, among which are: cultivation of other sensitive plants in the crop rotation cycle, such as peanuts and radishes; soils that are conducive to the disease, and the absence of effective eradication methods. The disease severely harms potato quality, severely afflicts peanuts (pitted scab and netted scab) and is liable to harm the quality of radishes. Potato seed tubers are one of the main inoculum source of soil infection; in fact they are the leading cause for the spread of the disease. Theoretically, disinfecting the soil with Formalin should reduce scab, yet several plots are known where even high doses of Formalin have not controlled the scab problem. For organically grown potatoes there is no solution.

### Research objective:

Evaluation of SG 101 as seed treatment for reduction of Common Scab on potato.

### Spring 2006 Trial, Gilat

The trial was carried out with the Desiree variety (imported from the Netherlands). The selected lot was severely infected with common scab (100%, index 5.45). The rate of infection with other diseases was low: 4% with *Colletotrichum* and 1.5% with *Rhizoctonia*.

Trials were carried out in random blocks with four replicates.

Date of planting: 29 January 2006. Dimensions of repetition furrows: 6 m × 1.85 m. Irrigation, fertilization and disease- and pest-treatments followed standard practices. Following defoliation, the crop was harvested with an experiment-harvesting implement (in June). The parameters examined included:

- a. Crop size distribution – samples were hand-sorted (by diameter) into recognized standard sizes: miniature (< 35 mm); small (35-45 mm); medium (45-55 mm) and large (> 55 mm).
- b. Infection of daughter tubers with diseases, particularly with scab. For this purpose, each tuber harvested was examined and the various levels of severity of disease infection were assessed. The four levels of severity of infection were: zero – clean tubers; low – affecting < 3% of the tuber surface; moderate – affecting 3-15% of the tuber surface; severe – affecting > 15% of the tuber surface. The results are presented in the data on rate of infection and disease index.

Table 1: Treatment of seeds

Treatment	Active ingredient	Concentration (g/L) of active ingredient	Dose per ton
Control			
SG	hydrogen peroxide	3.5%	N
Bactoril			600
Mancidan	mancozeb	83%	3000
TAROK			500
C103			50

## RESULTS

### 1. Effect of different treatments on vegetative indexes

Examination on 14 March 2006 of emerging and developing shoots treated with hydrogen peroxide showed evidence of phytotoxicity.

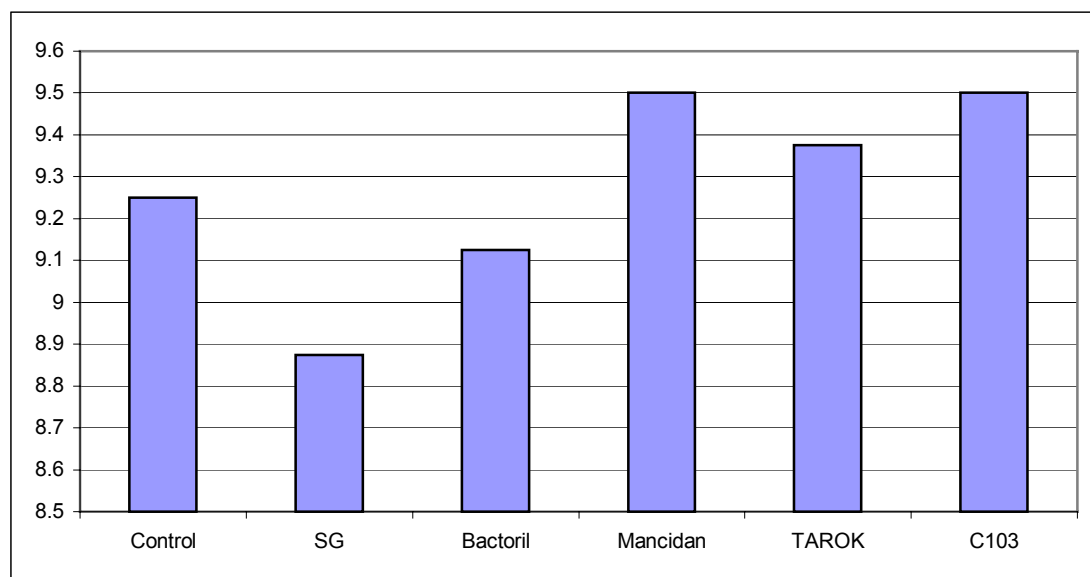


Figure 1: Effect of seed treatment on shoot emergence (44 days after sowing)

### 2. Effect of different treatments on crop distribution

Despite the phytotoxicity observed with hydrogen peroxide 44 days after planting, crop assessment (weight and satisfactory distribution of tubers) showed no statistical differences among the different treatments.

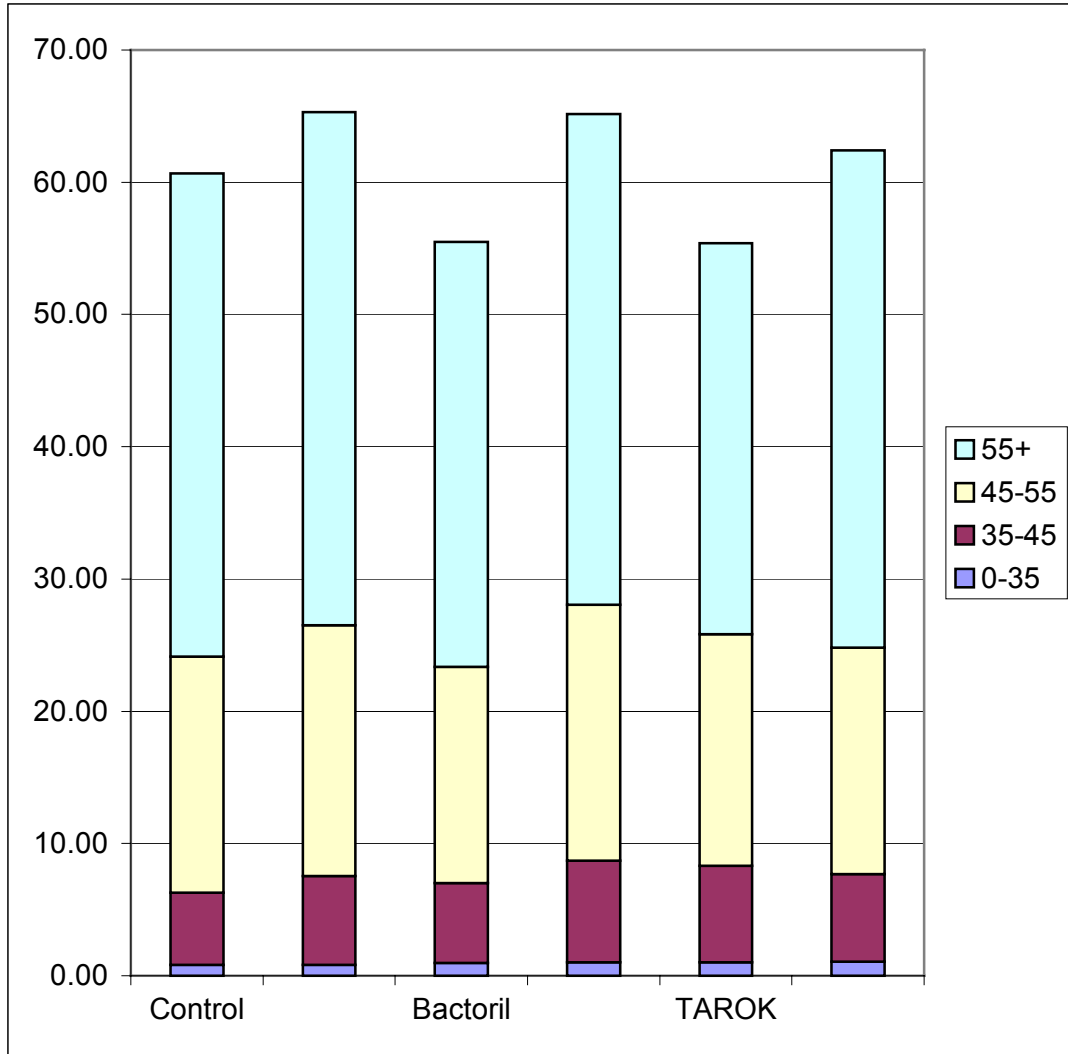


Figure 2: Effect of seed treatments on crop (kg/11 m<sup>2</sup> plot)

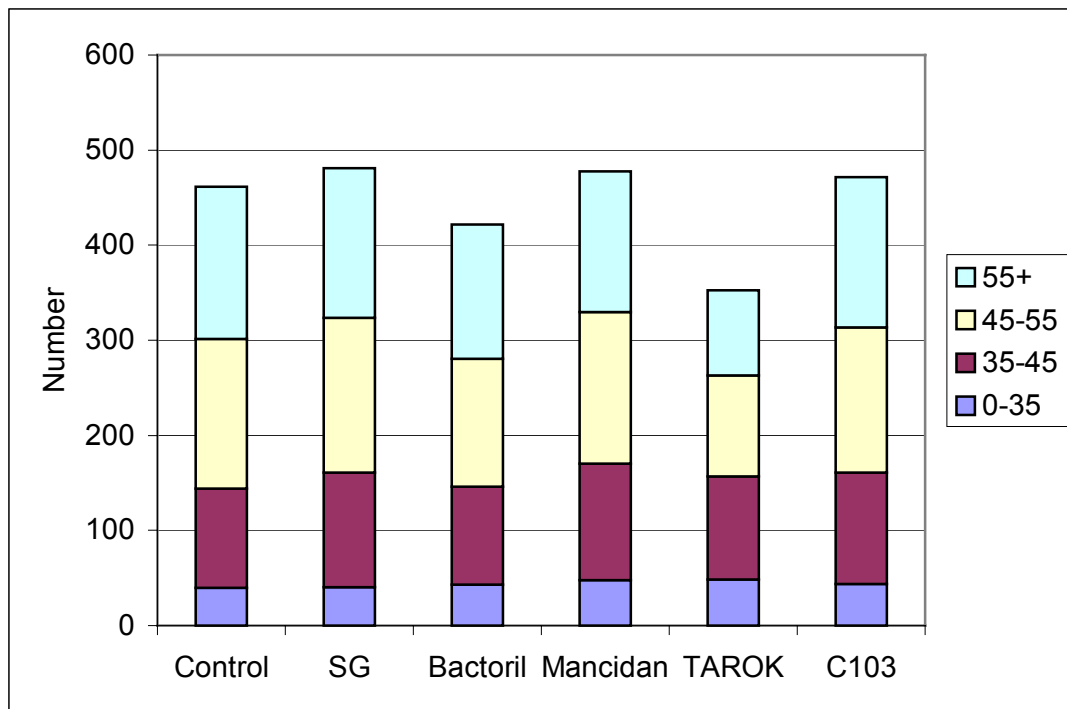


Figure 3: Effect of seed treatment on number of tubers (11 m<sup>2</sup> plot)

### 3. Effect of different treatments on diseases-infection rates on daughter tubers

The level of infection on seed tubers was very high (100%, with a high index); yet, the daughter tubers were found to have an infection rate of only about 10% (in the control). These findings are apparently attributable to the fact that the seed tubers were the sole source of the contagion, while scab disease symptoms correlate more strongly with a soil-borne inoculum. The most effective treatment for reducing infection with common scab was SG, followed by Mancidan and C103. Bactoril and AGF3 treatment results were indistinguishable from the control.

As for reduction of netted scab infection – all the treatments were statistically better than the control; the best among them were SG.

Silver scurf incidence on daughter tubers was reduced by Mancidan treatment. *Rhizoctonia* infection of daughter tubers was greatest with Bactoril. *Colletotrichum*-infection levels in daughter tubers were very low and no differences were found among treatments.

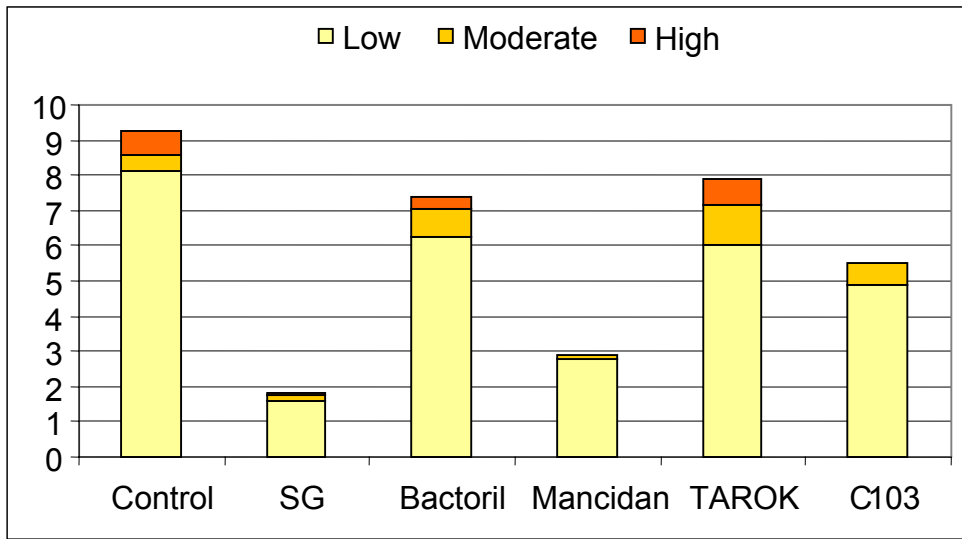


Figure 4: Effect of seed treatment on infection rate with common scab on daughter tubers (%)

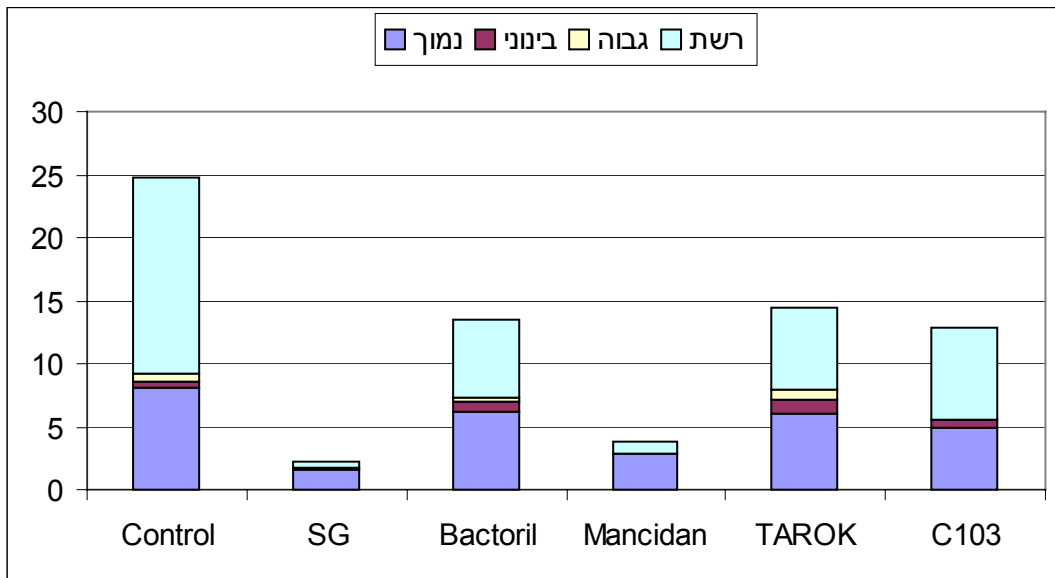


Figure 5: Effect of seed treatment on infection rate of common scab and netted scab

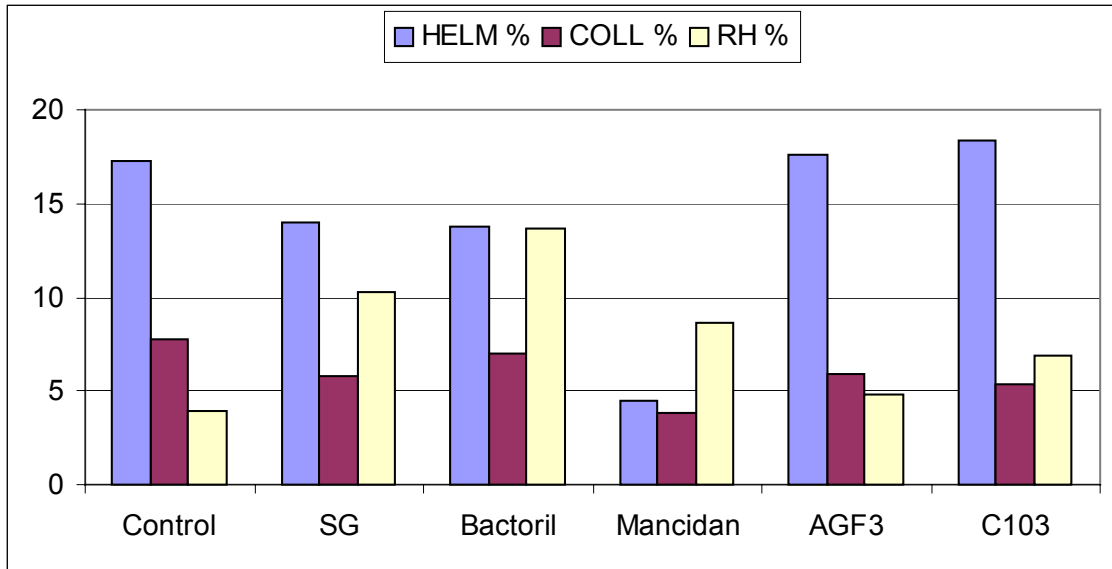
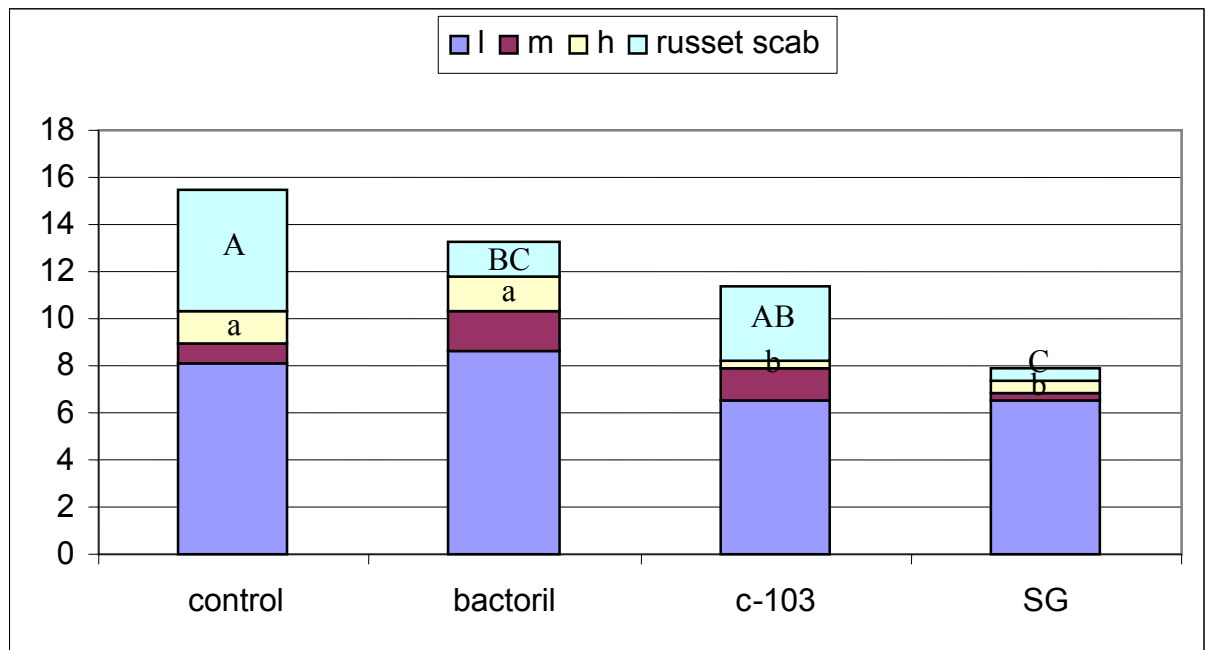


Figure 6: Effect of seed treatment on disease infection rates on daughter tubers

**Spring 2006 Trial, (Halutza)**

**Effect of different treatments on disease infection rates on daughter tubers**

Relative to the total rate of scab infection, significant differences among the treatments were not obtained. However, the severest infection was significantly reduced by treatment with SG and C103. Treatment with Bactoril was different from that the control treatment. Bactoril and SG treatments were effective in reducing netted scab infection and were statistically different from the control treatment.



## **Conclusions**

Scab-infection rate for daughter tubers was lower than for seed tubers, a fact that supports what is known about this disease, which is related more to contagion build-up during the growing seasons, and to the importance of the soil-borne inoculum as the determinant. Seed treatment with SG was effective, and it would be worthwhile to examine this treatment at a higher dose, and perhaps to test a furrow treatment to see if it can control soil-borne scab. Mancidan (dusting) was also seems to be a reducing agent, with an effect that was similar to what had been obtained from previous trials. Application of C103 also reduced infection but relatively less effectively than did the other applications mentioned.