STUDY ON POTATO COMMON SCAB CAUSED BY *STREPTOMYCES SCABIES* AND THE EVALUATION OF POTATO CLONES/VARETIES FOR RESISTANCE

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The common scab disease caused by *Streptomyces scabies* is common in all potato growing regions of the world. This disease causes major economic losses for potato growers and processing industry. In Vietnam, no accredited research has been known for this disease, especially in the field of breeding for resistance. With the current expanding processing industry, breeding for resistance has become an urgent subject, of which evaluation of breeding materials for resistance levels is crucial first step. For these reasons, the project "study on potato common scab caused by *Streptomyces scabies* and the evaluation of potato clones/vareties for resistance" was undertaken. The aim of this project is to set basic scientific premises for in-country long-term potato breeding activities.

Experiments were conducted at Potato-Vegetable-Flower Research Center, Dalat city, Lamdong province from 01/01/2011 to 30/08/2011. The plants were grown in pots and treatments were arranged by completely randomised design (CRD) with 3 replicates of 3 pots/replicate and one plant/pot. Planting substrate was sterilised with calcium hypochlorite 7 % seven days and the tools were sterilised for 25-30 minutes before use. Each 20 x 20 (cm) pot was filled with 500 cm^3 of sterilized sand-soil mixtrure of the ratio 1:1, and then filled with 1000 cm^3 mixtrure of sand-soil containing 10^{10} CFU of *S. scabies*. Disease-free plantlets or Go mintubers were planted in those pots. Water was applied by drip irrigation when the surface of substrate was dried and fertilizer was applied with 1% solution of NPK 12-5-7 for every three weeks. All treatments were placed in the net-house seedbeds 0,75 m high from the ground.

Experiment 1: Effects of substrate moisture on desease incidence and severity under artificial inoculation conditions

Experiment was conducted with 3 substrate moisture treatments: 40 – 50 %, 60 – 70 %, and 80 - 90 % for the whole season. The experiment result indicated that treatment with soil moisture at 60 – 70 % showed significantly considerable desease development and the method should reasonably reliable in use for the other experiments of artificial inoculation.

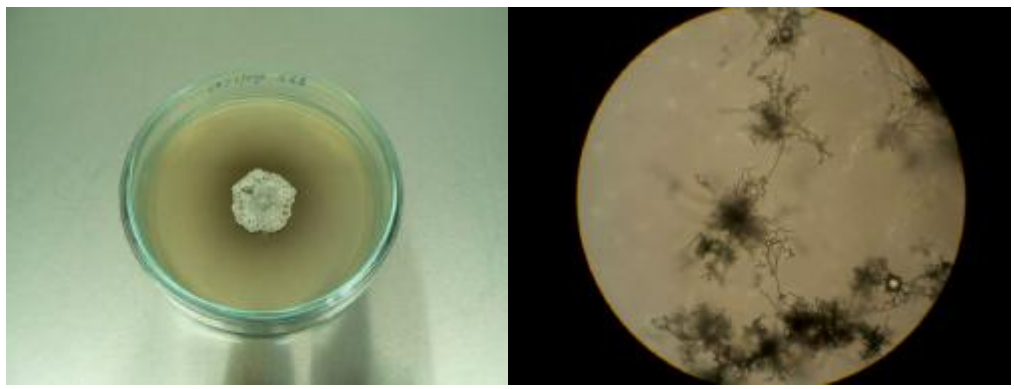

Figure 1 and 2. Colonies of *S. scabies* on WA environment

Experiment 2: Effects of pH_{H2O} on desease incidence and severity under artificial inoculation conditions

Treatments included keeping substrate pH_{H2O} at 5-5.5, 6-6.5 and 7-7.5 for the whole season. The experiment result showed that disease development and potato growth were best in treatment with pH_{H2O} 6-6.5 and this pH level should be used for the others common scab researches with artifical inoculation treatments.

Figure 3 and 4. Harvesting tubers in pH experiments

Experiment 3: Impacts of grown-substrate on common scab desease under artificial inoculation conditions.

The experiment was conducted with 6 treatments: 100 % black peat moss soil, soil-sand (ratio 1:1), soil-coconut peat (ratio 1:1); 100 % coconut peat, sand-coconut peat (ratio 1:1) and 100 % sand. The treatment with sand-coconut peat (ratio 1:1) showed the best result with a clearly defined disease symptom and a strong growth of potato plants. In addition, the materials are locally available at cheap price.

Experiment 4: Virulence evaluation of locally collected *Streptomyces scabies* isolates

The purpose of this experiment is to evaluate disease severity caused by 11 local *Streptomyces scabies* isolates collected from different locations in Lam Dong province on the variety Atlantic. The results showed that the isolate GTT4 was the most virulent which was used for further disease resistance level evaluatios of the breeding materials in the following experiments.

Experiment 5: Evaluation of scab resistance levels of potato clones/varieties under artificial inoculation conditions

The experiment was seperated into 2 sets of clones/varieties. Set 1 consisted of 22 selections and set 2 of 11 introduced-clones from the International Potato Center (CIP). The isolate GTT4 was used for inoculation of both sets. The resistance level was ranked following the method described by Bradeen (2007). From the results obtained, there were 12, 15 and 6 clones/varieties ranked as moderately resistant, moderately susceptible and susceptible, respectively.

Figure 5 and 6: Evaluation of *Streptomyces scabies* resistance of lines/varieties