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Field efficacy of slaked lime against European fruit tree canker and introduction into practice

Bart Heijne[1], Peter Frans de Jong[1], Pieter Jans Jansonius[2]

1 Wageningen UR/Applied Plant Research (PPO), P.O. Box 200, 6670 AE Zetten, The Netherlands; 2 Louis Bolk Institute, Hoofdstraat 24, 3972 LA Driebergen, The Netherlands

Fruit tree canker, caused by *Nectria galligena*, is an increasing problem in fruit growing areas with wet periods during the leaf fall period. Several effective fungicides against the disease, such as benzimidazoles, will be banned in future in Europe. There is an urgent need for environmentally friendly solutions for this disease. Several field experiments were done to determine the efficacy of slaked lime *(*calcium hydroxide) against European fruit tree canker. Pieces of wood with sporulating canker were suspended in the top of trees during leaf fall to secure a high inoculum pressure. Infection was through natural wounds like leaf scars and no artificial wounds were made. Newly formed cankers were counted in the following spring. Three spray applications of 100 kg/ha slaked lime at 10, 50 and 90 % leaf fall reduced the number of newly formed cankers by 57 % compared to untreated plots. The number of newly formed cankers was reduced by 60 % when 50 kg/ha of slaked lime was applied in a comparable experiment in the following year. A comparison between 25, 50 and 100 kg/ha of slaked lime resulted in a reduction of 34, 53, 37 % of newly formed cankers. Slaked lime was applied through the overhead sprinkler system in experiments at commercial growers' sites. The average efficacy was 60 and 62 % in two years respectively. Further demonstrations resulted in the regular use of slaked lime by commercial growers.

Calcium hydroxide, Fruit tree canker, Nectria galligena, Slaked lime

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Relation of duration of wet period and number of *Nectria* cankers for leaf scars and pruning wounds during the summer

Peter Frans de Jong[1], Adrie Boshuizen[2], Marcel Wenneker[1]

1 Wageningen-UR, Applied Plant Research, Lingewal 1, 6668 LA Randwijk, P.O. Box 200, 6670 AE Zetten, the Netherlands; 2 Bodata, AgroBussinesspark 42, P.O. Box 592, 6700 AN, Wageningen, the Netherlands

Fruit Tree Canker *(Nectria galligena* Bres.) is an important fungal disease in apple *(Malus* X *domestica* Borkh) in the Netherlands. The fungus causes cankers on the shoots, main branches and trunks of apple trees. It takes a lot of effort to control the disease and when infection takes place whole trees can be lost especially when they are young. This makes the pathogen a problem not only for fruit growers but also for fruit tree nurseries. Some of the most effective fungicides no longer permitted in the Netherlands. Therefore, interest from fruit tree growers is increasing for a warning system to optimize the use of the remaining less effective fungicides. This model should be used during the whole year because on several occasions wounds are made. To build this model data about the infection conditions are needed.

Detailed information of these conditions during the summer is lacking. Therefore an experiment was done with potted trees in the summer. To investigate a possible difference in susceptibility, two types of wounds were made, a pruning wound and a leaf scar. Trees received different length of wet periods at 20°C after inoculation with *N. galligena* spores. It was found that no wet period was needed to get a successful infection in the summer. Also no relation between the duration of the wet period and the amount of canker formation was found. Finally, it was found that pruning wounds were more susceptible than leaf scars in summer.

Warning system, Nectria galligena, Apple, Fruit

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Detection of latent infections of fruit tree canker *(Nectria galligena*) in planting material of apple

Marcel Wenneker, Nina Joosten

Applied Plant Research, Wageningen University & Research Centre, P.O. Box 200, 6670 AE Zetten, the Netherlands

Fruit tree canker *(Nectria galligena*) is a serious problem in *(*organic) apple production. Infections cause direct loss of yield by damage to productive shoots and branches, often leading to tree death. Control measures are applied to protect infection sites, notably leaf scars from external inocula. Young apple trees can be infected symptomlessly during propagation *(*latent infections). A test was developed for screening young apple trees from tree nurseries for latent infection by fruit tree canker caused by *Nectria galligena*, prior to planting in the orchard. Under specific conditions *(*high temperature and relative humidity) it was possible to induce symptoms in infected planting material within 8 weeks. Tests were performed with artificial inoculations to determine the sensitivity of the test. Screening of commercial planting lots with the newly developed method revealed infection incidences that were higher than recorded after planting in the orchard. The developed method is suitable for screening apple planting material for fruit tree canker infections before planting. The method also detects infections that initially stay latent under field conditions. The method seems valid to screen organically and conventional apple trees. However, the method is destructive; therefore an adequate sampling strategy needs to be developed.

Apple canker, Propagation material, Disease control, Screening method