RT 1 – Methods & parameters to evaluate the activity of a treatment

Stefano Di Marco

Aim: to discuss and develop a shared scientific approach for the evaluation of the activity of a treatment.

When does a treatment really work?

1. Targets – What to evaluate?

- **Apoplexy (% dead vines)**
- **Foliar symptoms (incidence and severity)**
- **Wood deterioration by pathogens (necrosis development, pathogens incidence)**

DISCUSSION

- ***Important to evaluate different parameters, as the starting conditions are very variable (different training system, different cultivars, different climate, …)***
- ***The percentage of dead vines is relevant parameter for all wood diseases***
- ***Foliar symptoms (incidence and severity) is a relevant parameter only for some diseases (eutypa and "Esca complex") , especially if they also cause a qualitative damage***
- ***The parameters to be surveyed must be related to the type of action of the control method tested***
- ***Analysis of wood deterioration ability by pathogens (necrosis development, pathogens incidence) should be done in surely NON infected or contaminated wood. In artificial inoculations the inoculated strain should be recognizable (markers)***

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2. The period/number of applications

DISCUSSION

- ***It is important to assess the number of treatment giving efficacy***
- ***Very important to run long term experiments***
- ***If it is a wound protection or trunk treatment product it is important to assess the duration of the protection and the physiological state of the plant (winter, spring, …)***
  - ***It should be done a better evaluation of the role and need of protection in green shoots***
  - ***Trials should consider the disease pressure and the wound susceptibility***

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3. Statistical approach

DISCUSSION

- ***In field trials randomized blocks are always preferable but a large number of vines, allowing a solid number of symptomatic vines to be surveyed, should always be carefully selected in each replicate (differences to be confirmed by Chi-square test)***
- ***Very relevant to carry out a pre-survey assessment***
- ***Choosing the field for the trial a high uniformity must be searched to avoid the presence of local symptom-inducing factors or gradients in symptoms development***
- ***The design of the trial has to be linked to the characteristics of the vineyard***

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4. Number of years of assessment (foliar symptoms: annual-cumulative incidence)

- **Assessment of foliar symptoms the years before/after the trial**
- **Age of vineyard**

DISCUSSION

- ***Trials have to be repeated at least for 2 years for canker and root diseases, while diseases with a high symptom fluctuation (grapevine leaf stripe disease (Esca complex), eutypa foliar symptoms) need to be repeated at least for 3 years***
- ***It was suggested that foliar symptoms are not considered a useful parameter as they are not directly related to wood colonization***
- ***Other opinions underline the importance of separating diseases causing only wood necrosis and death of the cordon, from diseases causing typical foliar symptoms as an 1) index of qualitative damage and 2) of advancement of the decline, as plants showing foliar symptoms will decline and die sooner***
- ***Pruning wound protection can not be evaluated by foliar symptoms in the short run, but if an effect is obtained in the long run (3 or more years) it can be acceptable***