

Information sheet 1.12

Roguing and pruning

This information sheet is a supporting document to Appendix A ('Standardised checklist of risk reduction options') of the Guidance of the EFSA Plant Health Panel on quantitative pest risk assessment

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A. Description of the RRO

Roguing is the complete removal of infested plants and/or uninfested host plants in a delimited area. Roguing is a common practice in forestry where the genetic purity of seed orchards is maintained by selectively removing low yielding trees (Laverack and Turner, 1995). In plant health, roguing is done in production places to remove infested plants/units from production places or areas in eradication, containment or certification programmes. As part of a precautionary approach, roguing may include the removal of suspicious (i.e. neighbouring) host plants or all host plants in a delimited area irrespective if plants are infected or not. The last situation is similar to maintenance of a pest free buffer zone (information sheet 2.07 Delimitation of buffer zones), e.g. as in EU emergency measures for Pine wood nematode¹.

In case the pest is present, roguing may be applied in certification systems to assure a guarantee of a specified low level or absence of infestation. Rogued plants are often replaced with healthy plants, particularly with perennial crops.

Pruning is a cultural practice consisting in the removal of plant parts with different purposes (e.g. to improve the quality of flowers, fruit, foliage or stems or to restrict the plant growth).

In the context of plant health the aim is to remove plant parts where the pest is present or supposed to be present.

B. Risk factors

The use of the RRO reduces the likelihood of the association of the pest (at origin) by acting on the:

- prevalence of the pest in the source area.

The applied RRO reduces the probability of establishment acting on:

- hosts/susceptible plant parts and alternate hosts that are present and their abundance or distribution.

The use of the RRO reduces the probability of spread of the pest acting on:

- suitability of the natural and/or managed environment for natural spread of the pest to other unintended habitats.

The use of the RRO reduce the probability of impact by

¹ Commission Implementing Decision (EU) 2012/535 of 26 September 2012 on emergency measures to prevent the spread within the Union of *Bursaphelenchus xylophilus* (Steiner et Buhner) Nickle et al. (the pine wood nematode).

- limiting the pest pressure.

C. Parameters to consider regarding effectiveness of the RROs

A key element for effective roguing/pruning is the detection of infected plants/plant parts in targeted surveys in delimited zones around outbreaks.

If latent infections occur, effective control with roguing may be limited. Depending on the dispersal ecology of the pest this latency effect can be circumvented by a precautionary approach by removing all plants adjacent to an infected plant or roguing an entire orchard or removing all host plants in a delimited area.

Failure of eradication can be due to reintroduction of infected material, insufficient surveillance and ineffective removal (e.g. regrowth of removed plant). For pathogens the visual detection of symptoms depends on the incubation period: delay between inoculation and the onset of the first symptom in the infected host.

There are several differential equation based models available to describe disease dynamics with roguing as a control strategy (Chan and Jeger, 1994). Sisterson and Stenger (2013) used a spatial explicit model to explore the factors influencing the efficacy of roguing strategies and they demonstrate that for vector transmitted pathogens roguing is expected to be more effective at suppressing pathogen spread when combined with vector control.

Table 1: Summary of parameters that can influence the effectiveness of roguing and pruning.

Parameter	Effect
Host plant range	Effect on practical feasibility of finding and removing all possible host plants/plant parts. Need to have a good knowledge on the host range and epidemiology of the pest (e.g. need for alternate hosts).
Distribution of host plants	Effect on detecting host plants/plant parts to be removed. Effect on practical feasibility.
Detectability	Effect on reliability of surveys and inspections; asymptomatic presence/latency time.
Dispersal ecology	Effect of spread of pest (in latency period) to neighboring plants/area.
Population pressure	Effect on immigration rate.
Dispersal range	Size of delimited area.

D. Applicability / feasibility of the RRO

The implementation of roguing in the natural environment (e.g. removal of potential host plants) may be restricted due to legal reasons such as the use of herbicides that are not registered in such areas or the destruction of plants in conservation areas (e.g. mature trees or tree hosting protected animals). There may be an opposition of the public or of the stakeholders, in particular to rogue asymptomatic plants.

The effective (i.e. permanent) removal of host plants can be difficult if regrowth is possible from unaffected plant plants (e.g. root parts).

Pruning is not recommended in the frame of eradication programmes because it cannot guaranty 100% of sanitation, mainly allowing only maintaining at low level the pest population.

Relevant examples of roguing are included in Annexes of the Council Directive 2000/29/EC² on protective measures against the introduction and spread into the European Union territory of organisms harmful to plants or plant products.

Annex IV, part a, section I defines the special requirements for the introduction and movement of plants, plant products and other objects originating outside the Union. Point 23.1. of this annex establishes an additional requirement for the introduction of *Prunus* plants for planting originating in countries where Plum pox virus is known to occur, consisting in the roguing out of plants at the place of production which have shown symptoms of disease caused by other viruses or virus-like pathogens.

In the same annex, point 20 concerning plants for planting of *Cydonia* Mill. and *Pyrus* L. originating in countries where Pear decline mycoplasma is known to occur requires the roguing out within the last three complete cycles of vegetation of plants at the place of production and in its immediate vicinity, which have shown symptoms giving rise to the suspicion of contamination by Pear decline mycoplasma.

Roguing of plants susceptible to *Erwinia amylovora* showing symptoms of infection in the field and its vicinity is also required in point 17 of Annex IVAI as option for the import of plants for planting of several genera into the EU territory.

E. Other RROs that may lead to similar effects

The combinations of RROs ensuring pest free area and pest free place/site of production lead to a similar effect. In particular, for annual crops, crop rotation can be considered equivalent in terms of expected effects in pest control to the practice of roguing for perennial plants.

F. Combinations of RROs that include this RRO

These RROs are important components of eradication (roguing) and containment (roguing and pruning) programmes. Surveillance to detect infected plants/plant parts in production units or the detection of host plants in the environment is crucial for an effective implementation of roguing and pruning. Testing for the presence of asymptomatic plants may be necessary.

Hygiene practices, in particular cleaning, disinfection and disinfestation of equipment used for roguing and pruning (information sheet 1.05 Cleaning, disinfection and disinfestation (sanitation) of facilities, tools and machinery) and appropriate waste disposal (information sheet 1.10 Waste management) shall be set up in order to avoid further spread of the targeted pests and of other organisms and the regrowth of the host plant.

When the spread of the targeted pest is assisted by a vector, roguing is associated with the application of insecticides or nematicides.

² Council Directive 2000/29/EC of 8 May 2000 on protective measures against the introduction into the Community of organism harmful to plants or plant products and against their spread within the Community.

G. Conclusion

Target	Area of application	Expected effect	Main technical limitations of use	Alternative/ combinations
Pest and vector	In the field or its environment	Reduce the probabilities (1) of entry acting on the association of the pest at origin, establishment (2) spread, (3) impact (population pressure).	<ul style="list-style-type: none"> - Detectability of symptoms and of host plants in the environment. - Abundance of host plants in natural environment. 	<ul style="list-style-type: none"> - Crop rotation - Other RROs insuring Pest Free Area, Pest Free Production Place/Site - Hygiene practices - Waste management - Crop chemical treatments.

References

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