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Linking fungicide dose rate to late blight resistance

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Summary

Potato crops are commonly sprayed preventively with fungicides to protect them against the late blight pathogen, Phytophthora infestans. The use of fungicides has to be reduced due to government policy in The Netherlands. A reduction might be achieved by using lower dose rates, whenever possible. It is assumed that cultivars with a higher level of late blight resistance could be protected sufficiently with lower dose rates compared to the advised dose rate used on susceptible cultivars.

Three field trials have been carried out to establish the effect of the contact fungicide fluazinam (Shirlan) in different dose rates on the protection of 30 widely grown cultivars against late blight. The experiments at Lelystad were sprayed with fluazinam based on a decision support system Plant Plus. Dose rates of Shirlan ranged form 0.08 to 0.4 liter / ha, including an untreated control. After three sprays cultivars were inoculated with a mixture of 15 isolates. These isolates were randomly selected from extensive sampling in 2000, and are considered to be representative for the current P. infestans population in the Netherlands. Late blight on foliage was scored twice weekly.

Late blight was controlled adequately by 40 % (0.16 liter / ha) of the advised dose rate of fluazinam when cultivars with a high rating for

late blight resistance on the national list were grown. Whereas susceptible cultivars required a dose rate of 0.32 – 0.4 liter / ha to obtain good control of late blight, depending on weather circumstances.

Experiments at Wageningen were carried out to establish the effect of the isolates used on the level of late blight resistance with the same 30 cultivars. Isolates were inoculated eiteher single or in a mixtrue of isolates. It was shown that using a single isolate was dangerous, since easily false conclusions could be drawn when the used isolate is not compatible with a certain variety, whereas other isolates might be compatible with the same variety.

When reliable ratings on late blight resistance are available, the dose rate of fluazinam could be adjusted to these ratings. By lowering the dose rate when cultivars are grown with a higher level of late blight resistance, still an efficient control can be achieved and at the same time a reduction in fungicide use.

NOTE: This conference was presented during the "Hungarian Eucablight Annual General Meeting", Keszthely, Hungary, October 24-28, 2004.

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