



Practice Abstract # 5

Delay the spray: DSS, late blight and the weather

Problem statement:

Decision support systems (DSS) are powerful tools that analyse local weather conditions to predict disease risk and guide targeted interventions. Potato yield and quality can be severely reduced by late blight (*Phytophthora infestans*), a highly destructive disease. Traditionally, it has been controlled using short-interval preventive sprays, resulting in 12–15 applications per season in the Netherlands. This strategy aims to fully protect foliage throughout the growing season. However, the spread and impact of fungal arable pathogens are highly dependent on weather: wet conditions usually promote epidemics, whereas dry conditions can slow or even stop their progression.

DSS predict potential disease outbreaks and provide timely guidance for Integrated Pest Management (IPM) strategies. Sprays are applied just before predicted infection events. In Northwest European conditions, on susceptible potato cultivars, DSS-guided IPM typically reduces the number of sprays by 2–3 per season compared with traditional weekly applications while maintaining the same level of disease control.

2025 IPMorama demonstrations:



Interface of the Farmmaps potato late blight DSS. Weather data and infection events (purple line) are given in the graph. Here, an infection event is calculated for 24 May. The colours in the top bar indicate the spray advice. Green: no spray advice, Yellow: preventive spray advice, orange: curative spray advice and red: eradicator spray advice. Preventive spray advice is given for 23 May.



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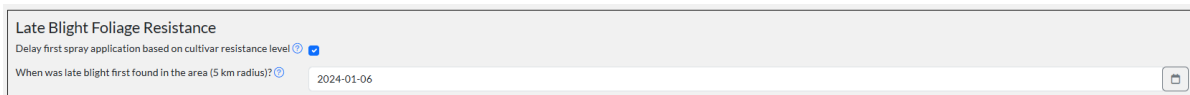




DSS played a key role in IPMorama’s late blight control demonstrations in Poland, Scotland, and France. Preventive sprays were applied only prior to predicted infection events. On susceptible cultivars, spraying began from the emergence of the first symptoms, while on more resistant cultivars, the first spray was delayed—the higher the resistance level, the longer the delay.

Decision Support on More Resistant Cultivars

More resistant potato cultivars can also become infected by late blight, which can lead to unwanted erosion of resistance. However, infections on these cultivars generally occur later than on susceptible varieties, and the timing of the first spray is influenced by weather conditions. DSS-guided control strategies exploit this difference by calculating the optimal delay before starting sprays, ensuring fungicides are applied only when necessary. Once spraying begins, timing follows DSS recommendations, helping to maintain effective disease control while reducing selection pressure on the pathogen and preserving cultivar resistance



The Farmmaps BlightApp offers the possibility to delay the 1st spray application on more resistant cultivars. This delay is weather dependent and calculated by the DSS. The user has to purposely activate this functionality and supply the date when late blight is first found in the area. This date is used as a starting point to calculate the delay of the 1st application.

	Veredelaar/Handelshuis	Rasnaam *
Groep		
A	Agrico	Carolus, Twinner, Twister
	Averis	Antora
	HZPC	Cayman
	Meijer Potato	Sound, Lady Jane
B	Agrico	Alouette, Ardeche, Nofy
C	Agrico	Levante
	Geersing Potato Specialist	Camillo, Cammeo, Esperanto
	Plantera	Vitabella
D	Agrico	Beyonce, Sevilla
	Geersing Potato Specialist	Peter Pan
	Meijer Potato	Acoustic
E	Agrico	Jacky
	Solana Holland	Nola
F	Averis	Aveline, Avenger, Avito
G	HZPC	Invictus
H	Solana Holland	Connect

Source: <https://www.bo-akkerbouw.nl/files/Pdfs-algemeen/Schema-rassen-met-verbeterde-resistentie.pdf>





Benefits:

- **Reduced pesticide use:** DSS-guided timing reduces the number of sprays by 2–3 per season on susceptible cultivars.
- **Targeted interventions:** Sprays are applied only when and where disease risk is high, increasing efficiency.
- **Sustained disease control:** Maintains the same protection as traditional preventive strategies.
- **Adapted to cultivar resistance:** Spray timing adjusts based on the susceptibility of each cultivar.
- **Resistance preservation:** On more resistant cultivars, optimal spray timing reduces selection pressure on the pathogen and helps prevent erosion of resistance.
- **Environmentally friendly:** Minimizes unnecessary fungicide applications and reduces chemical exposure.
- **Economic savings:** Lower input costs without compromising yield or quality.

Practical recommendations:

- Use DSS to monitor **local weather conditions** and predict potential late blight outbreaks.
- Apply IPM sprays **only before predicted infection events**, rather than on fixed intervals.
- For susceptible cultivars, begin spraying from the **emergence of the first symptoms**.
- On more resistant cultivars, **delay the first spray** according to DSS guidance, taking into account cultivar resistance and weather conditions.
- Once spraying begins, **follow DSS recommendations for timing and frequency** to maximize disease control and protect resistance.
- Integrate DSS guidance into existing farm management practices to **optimize timing, reduce costs, and maintain effective disease control**.

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