



growers' advice

Fight against Blight

ISSUE 7: SPRAY PROGRAMME



Fungicides still have a key role to play in the control of blight although the frequency of application and choice of product depends on a number of factors including disease risk, weather conditions, fungicide mode of action, resistance management issues and, not least, the stage of growth of the crop.

Blight fungicides should be used protectively and be applied before blight infects the crop. Starting the spray programme early enough and maintaining the correct spray intervals during the season for the prevailing risk is just as important as the choice of fungicide. Risk assessment means having as accurate a picture as possible of local blight outbreaks, recent infection periods and weather forecasts. This information sheet can only give an outline of some of the issues involved and for recommendations applicable to specific crops/locations you should discuss with your potato agronomist.

One approach when selecting fungicide products for blight control is to consider the stage of crop development. There are essentially four phases of growth.

Phase 1: Emergence to start of rapid haulm growth.

- Very early application during this stage is usually only necessary in conditions of high risk i.e. if infection is known or suspected locally, if seed-borne infection is a possibility or if weather conditions are favourable to blight sporulation.
- Cost can be an issue at such an early stage of crop development and a contact fungicide would be acceptable in this situation, providing that crop growth is not too rapid.
- If growth is rapid products with systemic / translaminar activity should be considered.
- Cymoxanil and dimethomorph have limited curative action, which is useful if early infection periods are missed (maximum of 2 days kickback).

Phase 2: Rapid haulm growth.

- Need to protect new growth.
- Consider use of systemic products.
- Restrictions may apply on the number of applications of some phenylamide containing products.
- Cymoxanil and dimethomorph have limited curative action, which is useful if the intervals are inadvertently extended in adverse weather conditions.

Phase 3: End of rapid haulm growth to start of senescence.

- For slower growing haulm, a range of contact and translaminar fungicides are equally appropriate.
- Products with good tuber blight activity should be considered.
- Products should be alternated as part of a resistance management strategy. Check the label recommendations.
- Cymoxanil and dimethomorph have limited curative action, which is useful if the intervals are inadvertently extended in adverse weather conditions.

Phase 4: Start of senescence to complete haulm destruction.

- Products with good tuber blight activity should be used.
- Spray programmes should continue until complete haulm death.
- Cymoxanil and dimethomorph have limited curative action, which is useful if the intervals are inadvertently extended in adverse weather conditions.

Intervals between applications

- Observing the minimum interval between applications is a legal requirement (Control of Pesticide Regulations, 1986) and if applicable this is stated on the product label.
- In conditions of high blight pressure e.g. when infection is present in the crop, reducing the interval between applications below 7 days may be necessary. This may affect product choice.

Decision support systems

Decision support systems are an invaluable aid to assessing blight risk and deciding on spray intervals. Two examples of internet based warning systems available in GB are www.potatocrop.com (Blight Watch using interpolated Smith Period values) and www.syngenta-potato.co.uk (Blight Alert based on PLANT-Plus)

Tuber Blight

- Tuber blight control should be considered from the time the crop initiates tubers
- Tuber infection is invariably associated with foliage or stem infection, especially lesions in the bottom of the canopy.
- Even low levels of foliar blight can produce sufficient inoculum to result in significant tuber infection
- Tuber blight can develop in as little as a week after the first signs of foliar blight.
- Good foliage / stem blight control will indirectly reduce the risk of tuber blight.
- Tuber infection is mainly caused by motile zoospores, which are produced in the cooler temperatures of early spring, late summer and early autumn. Zoospores produced on infected foliage are washed into the ridges by rainfall and move between the soil particles to infect the daughter tubers
- Electis, Ranman TP, Shirlan and Sonata have claims for activity against zoospores and in trials these have been shown to reduce the level of tuber infection. However, only Shirlan claims any protection against tuber blight on the label.
- Consider using products that have activity against zoospores.
- Adequate depth of soil cover over progeny tubers is important to minimise the risk of tuber infection.

Resistance management strategies

Guidance on strategies to avoid or reduce the risk of fungicide resistance is continually reviewed by the agrochemical industry via the Fungicide Resistance Action Committee (FRAC) www.frac.info/ or by the UK Fungicide Resistance Action Group (FRAG).

FRAC are regional committees throughout Europe comprised of representatives from the Agrochemical industry. The UK Fungicide Resistance Action Group (FRAG) also includes representation from the Pesticides Safety Directorate and researchers working on fungicide resistance as well as representatives of the Agrochemical industry.

For further information on resistance management please see BPC Growers Advice; Fungicide Resistance Action Group (FRAG-UK) – Potato late blight: Guidelines for managing fungicides resistance. www.potato.org.uk/blight

To reduce the risk of resistance it is advisable to use different modes of action whenever possible

Rain-fastness

- Newer products tend to have shorter rain-fast times (as short as one hour)
- Consult the label or supplier for advice on rain-fastness if the weather is poor or irrigation is planned.

Adjuvants

- Seek technical advice before inclusion. Certain advisors feel there is a benefit from using adjuvants to improve efficacy of blight sprays. However, there is little independent scientific evidence to justify inclusion of adjuvants or for choice of adjuvant. The exception is Ranman TP for which use of Ranman B is essential.

LERAP

- Some products carry a category B rating and this may influence your product choice.

While every effort has been made to ensure that the information is accurate, no liability can be accepted for any error or omission in the content or for any loss, damage or other accident arising from the use of the fungicides listed herein. Omission of a fungicide does not necessarily mean that it is not approved and available for use within GB/UK. It is essential to follow the instructions given on the approved label before handling, storing or using any blight fungicide or other crop protection product.

USE PESTICIDES SAFELY, ALWAYS READ THE LABEL

For more information on specific products, please consult your local BASIS registered advisor or BPC agronomist Mark Prentice Tel 0131 4724149.

Always consult your buyer protocols before using any pesticides

POTATO BLIGHT FUNGICIDES

Product	Active Ingredients	Dose rate (l/ha or kg/ha)	Maximum No. of applications	Spray Intervals	Harvest Interval	LERAP	Mode of Action	Movement in plant
Adagio	274 g/l mancozeb + 201 g/l chlorothalonil	2.4-3.2 l/ha	5	7, 10 and 14 days	7 days	B	Protectant	Contact
Chlorothalonil Various names	Various strength chlorothalonil	Various depending on strength	Various depending on strength	7, 10 and 14 days	7 days	B	Protectant	Contact
Consento	75 g/l fenamidone + 375g/l propamocarb hydrochloride	2.0 l/ha	6 (in blocks of 3) or 50% of programme	7-10 days	7 days	B	Protectant	Systemic, contact & translaminar
Curzate M 68, Rhythm and others	4.5% w/w cymoxanil + 68% w/w mancozeb	2 kg/ha	No limit	7, 10 and 14 days	None	None	Protectant with limited curative	Translaminar and contact
C 50	500g/kg cymoxanil	0.18-0.24 kg/ha	4	7, 10 and 14 days	7 days	None	Limited protectant with limited curative	Translaminar
Epok	400 g/l fluazinam + 200 g/l metalaxyl-M	0.375 l/ha	5 (but 3 recommended)	7	7	B	Protectant	Contact and systemic
Electis/Roxam	8.3% w/w zoxamide (zoxium) + 66.7% w/w mancozeb	1.8 kg/ha	10	7, 10 and 14 days	7 days	B	Protectant	Contact
Fubol Gold WG	4% w/w metalaxyl-M + 64% w/w mancozeb	1.9 kg/ha	3	7, 10 and 14 days	7 days	None	Protectant	Systemic and contact
Globe	60 g/kg cymoxanil + 700 g/kg mancozeb	1.5kg/ha	6	7, 10 and 14 days	7 days	B	Protectant with limited curative	Translaminar and contact
Intro Plus , Tairel Galben M	8% w/w benalaxyl + 65% w/w mancozeb	2 kg	5 (3 recommended)	10-14 days	7 days	None	Protectant	Systemic and contact
Invader	75 g/kg dimethomorph +667 g/kg mancozeb	2 kg/ha	8 (max dose 16 kg/ha)	7, 10 and 14 days	7 days	B	Protectant with limited curative	Translaminar and contact
Mancozeb Various names	Various strength mancozeb	Various depending on strength	No limit	7, 10 and 14 days	7 days	None	Protectant	Contact
Merlin	375 g/l propamocarb + 375 g/l chlorothalonil	1.5-2.5 l/ha	Maximum total dose 15 litres/ha	7, 10 and 14 days	7 days and not after end August	B	Protectant,	Systemic and contact
Ranman TwinPack	400 g/l cyazofamid + organosilicone adjuvant	0.2 l/ha + 0.15 l/ha	6 (in blocks of 3 with 3 different modes of action between)	7 -10 days	7 days	None	Protectant	Contact
Shirlan and others	500 g/l fluazinam	0.3 l/ha	10	5, 7, 10 and 14 days	None	B	Protectant	Contact
Sonata	100 g/kg fenamidone +500 g/g mancozeb	1.5 kg	6 per crop (in blocks of 3) or 50% of programme	7 days	7 days	B	Protectant	Contact and translaminar
Tanos	25% w/w famoxadone +25% w/w cymoxanil	0.5-0.7 kg/ha	6 (in blocks of 3) or 50% of programme	7 -10 days	14 days	B	Protectant with limited curative	Contact and translaminar
Tattoo	248 g/l propamocarb + 302 g/l mancozeb	4 l/ha	5	10 and 14 days	14 days and not after end August	None	Protectant	Systemic and contact

Source potatocrop.com 2003. Updated BPC 2004.

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Products withdrawn after 2003: Patafol, Recoil, Ripost, Trustran and products containing tin (fentin acetate and fentin hydroxide).