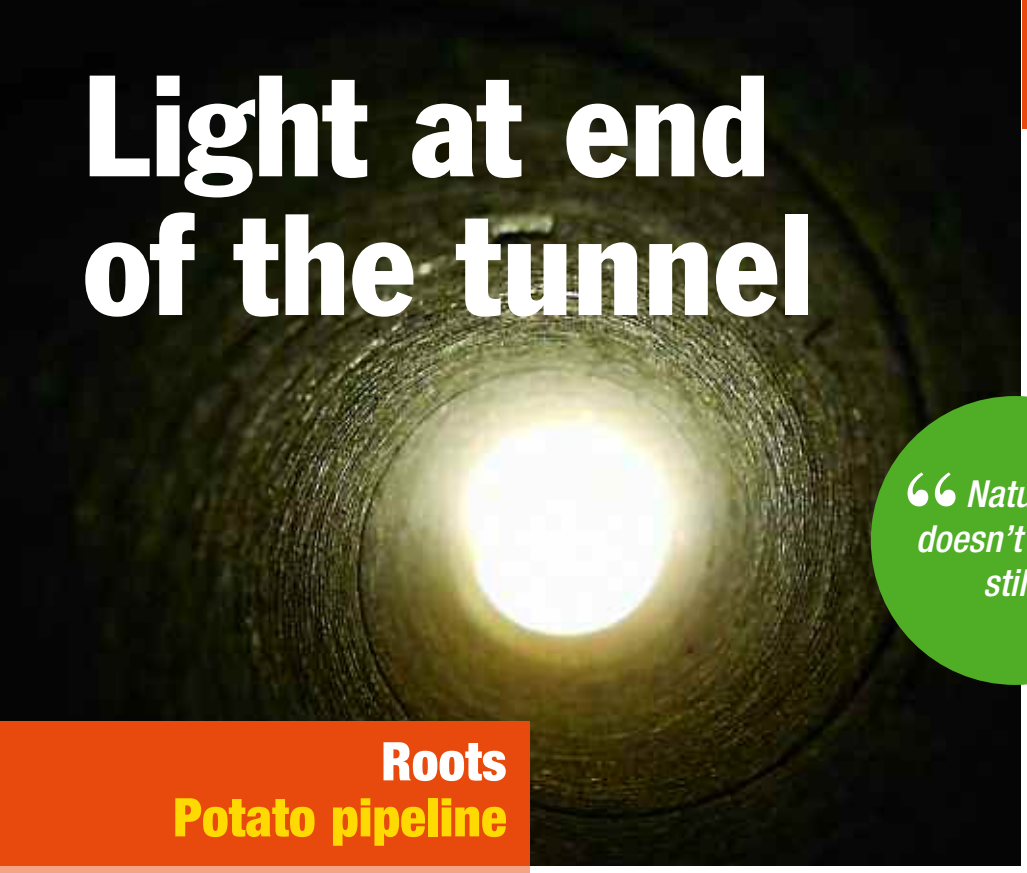
Light at end of the tunnel



> *“Nature doesn’t stand still.”*

Roots
Potato pipeline

At a time when active ingredients are fast disappearing, there may be a glimmer of hope for potato growers as BASF announce a bulging development pipeline, with the first new product anticipated next year. *CPM* reports.

By Lucy de la Pasture

Looking back over the past 50 years BASF has developed some stalwart potato products — such as Basagran (bentazone) in 1974 and Invader (dimethomorph+ mancozeb) in 1983, with Ranman TP (cyazofamid) launched in 2001.

More recently the ranks have been swelled by the addition of Allstar (fluxapyroxad) in 2017 and Enervin (ametoctradin) earlier this year. But a new chapter is about to start with a development pipeline that’s busting at the seams with potato products in all classes — fungicides, herbicides and insecticides, explains BASF’s Matt Goodson.

It reflects a change in BASF strategy which now places horticultural crops at a par with cereal crops in terms of importance. “World agriculture is facing a situation where the future requirement for food will drive an increase in productivity, but in a sustainable way as the industry meets carbon neutral targets and improves biodiversity and transparency.

“Meanwhile pest and disease resistance and sustained loss of existing plant protection products means there’s a strong demand for novel modes of action,” he says.

The view from BASF is that a strong focus on digitalisation and farm management systems will be the key to meeting some of the challenges that lie ahead.

Changing populations

“But nature doesn’t stand still,” comments Paul Goddard, BASF’s technical led for the potato portfolio. “There’s a saying that there’s nothing as constant as change and late blight (*Phytophthora infestans*) is a prime example of this. And with its changing population has come resistance to phenylamide fungicides from the 13_A2 strain and resistance to fluazinam from the 33_A2 and 37_A2 strains of late blight.”

To combat an evolving blight population the potato industry would benefit from innovation and new fungicide options, believes Paul. Recognising this, BASF have invested heavily in potato R&D and now have three fungicides, two herbicides and two insecticides (one of which is a biological) in the near-market pipeline, all hoped for within the next five years.

The first new fungicide for late blight control, Enervin, was launched earlier this year containing ametoctradin, which has been available previously in the BASF product, Percos (ametoctradin+ dimethomorph). “Enervin belongs to the QoSI group of chemistry which provides a useful alternative to products with CAA (carboxylic acid amine) and QoI chemistry,” explains Paul.

Currently agricultural fungicides can bind at three different sites within cytochrome b (complex III of the electron transport chain) — these are known as QoIs, QoSIs and QiIs. The largest group are the QoIs (FRAC group 11) which bind at the Quinone outside site. The QoSI fungicides (such as Enervin) also bind at the Quinone outside site but to the stigmatellin subsite (FRAC group 45), whereas the last of the three ‘Q’ groups binds to the Quinone ‘inside’ site (FRAC Group 21), providing a different mode of action.

No cross-resistance has been detected between the three groups, but all are limited to no more than three consecutive applications under resistance management guidelines, in common with those in the CAA group of fungicides.

“Enervin must be applied with a fungicide with a different mode of action but is a great mixer product because it’s from a different FRAC group and up to four applications are allowed, but no more than three consecutively,” explains Paul.

The closest products in the BASF pipeline and currently anticipated to pop out in 2021, dependent on the regulatory authorities, is another late blight fungicide, BAS657. There’s some excitement about this product as it brings multisite activity, he comments.

“BAS657 contains ametoctradin plus potassium phosphonate which have been formulated in such a way that the actives work in synergy, so the fungicide delivers more than would be expected from the sum of its parts.”

Potassium phosphonate belongs to a group of fungicides that’s new to the potato armoury and is responsible for host plant defence induction (FRAC group P07) so

Matt Goodson announces that BASF have more potato products to bring to market in the next five years than in the past 100 years.

BAS657 combines two very novel modes of action (MOA).

"In trials BAS657 is standing out with just 25% of the disease levels seen where plots have been treated with Ranman Top and has looked one of the strongest blight products in SRUC and Eurofins trials."

The new blight product has systemic and contact activity so Paul anticipates its main period of use will be when the canopy is expanding rapidly to early stable canopy. It will also give growers more flexibility in their blight programmes by freeing up QoI and CAA chemistry for use at the end of season for tuber blight control.

A new herbicide product (coded BAS656) contains dimethenamid-P and is also very close to emerging from the pipeline, with its arrival anticipated in 2021.

"With the losses of linuron and diquat, together with likely restrictions on dose for a number of other actives, weed control in potatoes has changed and will continue to change dramatically. In the future it will be more complicated with more complex tank mixes," says Paul.

"Dimethenamid-P is a new MOA mixer herbicide for pre-emergence application to potatoes. It's an acetamide (HRAC code K3) which is a long chain fatty acid inhibitor. Uptake is by the shoots and roots of weeds and BAS656 is strong on a range of species including black bindweed, black nightshade, cleavers and cranesbill, which are weaknesses for most other pre-em herbicides."

Following behind these is a new insecticide product — coded BAS480 BCI — for the reduction in wireworm damage in potatoes, with approval anticipated towards the end of 2022. It's a biological active containing *Beauveria bassiana* formulated with an attractant bait in a granular form and will be applied at a rate of 10kg/ha, explains Paul.

Beauveria bassiana is an entomopathogenic fungus which can infect a number of arthropod pest species. Coniodospores of the fungus attach to the insect's cuticle and then germinate producing penetrating hyphae, which enter and proliferate inside the insect's body. The fungus then feeds on its host which will become progressively more dehydrated and/or depleted of nutrients, leading to its demise.

Granule applications

"We're testing to confirm application through current granule applicators and the new product has potential for overall and in-furrow applications, with no harvest interval. In trials the damage from wireworm has been reduced by around 50% and the coded product has been performing with efficacy close to that seen with the previously available wireworm treatment, Mocap (ethoprophos), which is now withdrawn," says Paul.

Summing up, Matt adds that a little further away is a new aphicide which, if it successfully leaps the regulatory hurdles in front of it, will provide growers with another option in an area which has been particularly hard-hit by product withdrawals in recent seasons. With more potato products expected from the BASF pipeline over the next five years than in the past 100, the company aims to support growers produce more and better potatoes under challenging conditions, he concludes. ■

Next year will see the arrival of a new multi-site blight fungicide with systemic activity and a new pre-emergence herbicide, says Paul Goddard.

Weed spectrum for pre-em herbicides

	prosulfocarb (3200g)	metribuzin (600g)	clomazone (90g)	prosulfocarb (3200g)	MTN+FFT (438+625g)	pendimethalin (1320g)	aclonifen (1050g)	BAS656 (850g)	PDM+BAS656 (1000+850g)
AMG	S	S	MS	S	S	S	-	-	S
Blackgrass	S	S	R	R	S	S	-	-	-
A nettle	S	S	MS	-	S	S	-	-	S
B bindweed	MS	MS	MS	MR	MS	-	MR	-	S
B nightshade	R	R	MR	-	MS	MS	-	-	S
Chickweed	S	S	S	S	S	S	-	S	S
Cleavers	R	R	S	-	MS	MS	MR	S	-
Cranesbill	-	R	R	-	MR	-	-	S	-
Deadnettle	S	S	MS	M	R	S	-	S	S
Fathen	S	MS	MR	S	S	S	S	-	S
Forget-me-not	S	S	R	-	S	S	-	-	MS
Fumitory	S	MS	R	-	MR	MS	-	-	-
Groundsel	S	S	MS	S	S	-	-	-	MS
Knotgrass	S	MS	MS	MS	S	S	-	-	S
Mayweeds	S	S	R	S	S	-	S	-	S
Pansy	S	MS	R	-	S	S	MS	-	MS
Poppy	S	S	R	-	S	S	-	-	MS
S Purse	S	S	S	S	S	MS	-	S	S
Speedwells	S	S	MS	-	S	S	-	S	S

Source: BASF, 2020.