
CERTIS
HP
SLUXX®
HIGH PERFORMANCE

SLUXX HP HIGH PERFORMANCE

DELIVERING TIME AFTER TIME

- Excellent efficacy
- Recommended for all crops
- Deeper, darker blue pellet = better visibility on the field
- Excellent resistance to mould
- A uniform pellet, which spreads evenly
- No buffer zone required
- Active ingredient breaks down into plant nutrients
- High quality pasta based pellets
- Low impact on non-target organisms
- Approved for use in organic systems*





Grey field slug *(Deroceras reticulatum)*



Keeled slug *(Milax/Tandonia budapestensis)*



Garden slug *(Arion hortensis)*

Photographs reproduced with permission of Dr Gordon Port, Mollusc Centre of Expertise, Newcastle University.

The slug problem

The UK climate is particularly favourable for the breeding and multiplication of slugs.

Warm/wet conditions, especially during spring and autumn, encourage slugs to reproduce just at the time when crops such as potatoes, winter cereals and oilseed rape are at their most vulnerable to attack.

Slug problems seem to be increasing with heavy infestations in many areas in recent years. This trend is not specifically due to milder winters as a result of climate change, as some slug eggs can survive temperatures as low as -5°C before any reduction in viability occurs, and adults can also survive adverse conditions by moving down the soil profile.

Just as important as any change in climate are changes in rotation and tillage systems that enable populations to survive and breed at an increased level.

In theory, one slug could be responsible for over 4m offspring in a year under ideal conditions. (Based on 2,000 eggs laid with each of the offspring having one further generation).

There are a number of species of slugs native to the UK of which three are of economic significance:

- **Grey field slug** *(Deroceras reticulatum)*
- **Keeled slug** *(Milax/Tandonia budapestensis)*
- **Garden slug** *(Arion hortensis)*

According to AHDB's crop divisions, slug damage, if not controlled, could cost UK agriculture up to £100m per year and some crops, especially oilseed rape, could not be grown economically in large parts of the country without the use of molluscicides.

Traditionally, control of slug infestations has been achieved by using either metaldehyde or methiocarb based pellets (methiocarb was revoked in 2014). Now Sluxx HP (High Performance), an even more advanced formulation ferric phosphate slug pellet, is available to farmers and growers to combat these destructive pests.

* Sluxx HP (MAPP 16571) complies with the Organic Farmers and Growers standards, and is approved for use in organic systems

Advanced formulation slug killer

Sluxx HP is a high quality, 'pasta' based pelleted bait containing ferric phosphate in a unique improved formulation which has been approved for the control of slugs.

The active ingredient

Ferric phosphate is a naturally occurring substance in soils. It is well known in the metabolic processes of both plants and animals and is also a food grade ingredient. It has been accepted onto the EU Annex 1 list of approved crop protection active ingredients as a substance for the control of molluscs.

Mode of action

Once ingested by the slug, ferric phosphate causes pathological changes to the slug's digestive system in both the crop (stomach) and hepatopancreas (digestive organ) causing it to quickly stop feeding.

This rapid cessation of feeding activity means crop protection is maximised while plant damage is minimised.

Slugs ingesting a lethal dose of ferric phosphate cannot recover. They become less mobile and die within 3-6 days, often underground. It should therefore be noted that evidence of dead slugs cannot always be seen post application.

It is therefore very important to monitor signs of crop damage in order to measure the effectiveness of the treatment.

Product information

Sluxx HP (MAPP16571) has been approved in the UK as a unique, patented high quality bait. It contains 3% ferric phosphate which is formulated using durum wheat into a high quality, wet extruded, 'pasta' pellet.

Label recommendations

Sluxx HP can be used on all edible and non-edible crops (outdoor and protected) as well as on amenity vegetation. There are no specific buffer zone or no-spread zone restrictions.

The maximum individual dose rate is 7kg/ha.

Under severe infestation pressure, applications can be repeated if required as long as the maximum total dose of 28kg/ha/crop is not exceeded.





Efficacy

Sluxx HP has excellent efficacy, as good as other leading products on the market. Extensive trials have been conducted on a range of crops including oilseed rape, wheat, barley and potatoes.

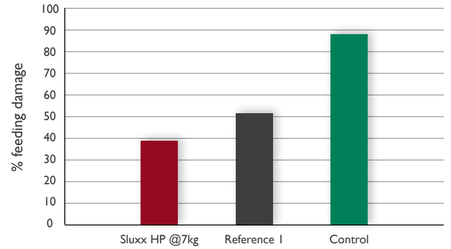
The following series of trials data demonstrates the efficacy of Sluxx HP compared to a range of alternative products based on different active ingredients. They demonstrate that Sluxx HP delivers both crop protection and is lethal to slugs.





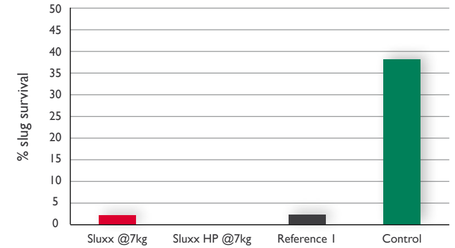
Efficacy in oilseed rape: % Feeding damage

Source: W. Neudorff GmbH KG.



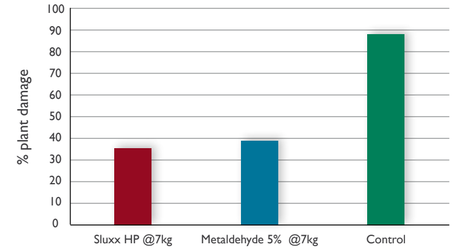
Efficacy in oilseed rape: % Slug survival

Source: W. Neudorff GmbH KG.



Efficacy in oilseed rape: % Plant damage

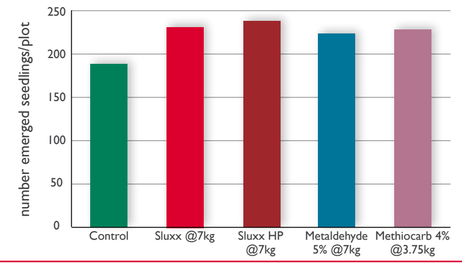
Source: W. Neudorff GmbH KG.



Efficacy data from field trials

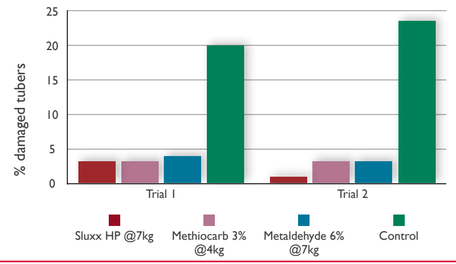
Efficacy in winter wheat: Number of emerged seedlings

Source: W. Neudorff GmbH KG.



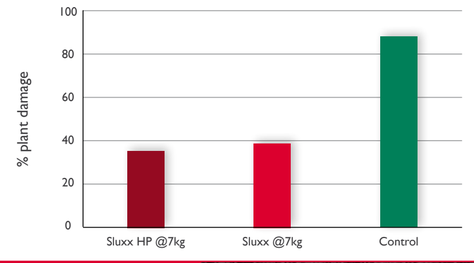
Efficacy in potatoes: % Damaged tubers

Source: W. Neudorff GmbH KG.



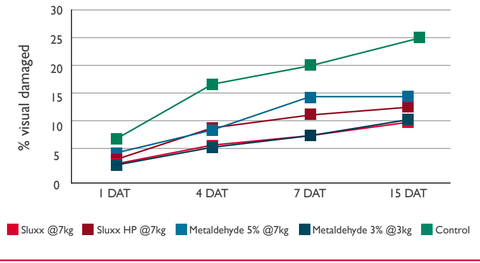
Efficacy in cabbage: % Plant damage

Source: W. Neudorff GmbH KG.



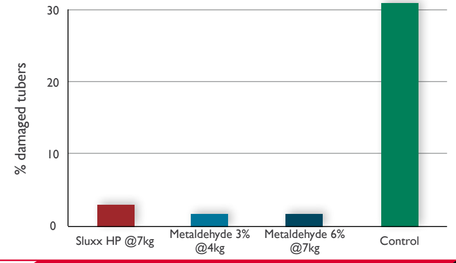
Efficacy in winter wheat: % Plant damage

Source: W. Neudorff GmbH KG.



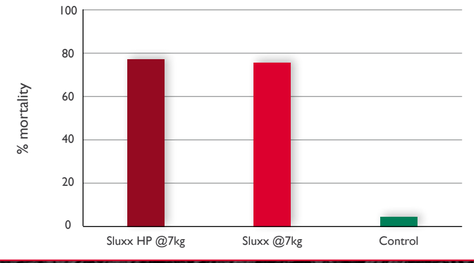
Efficacy in potatoes: % Damaged tubers

Source: W. Neudorff GmbH KG.



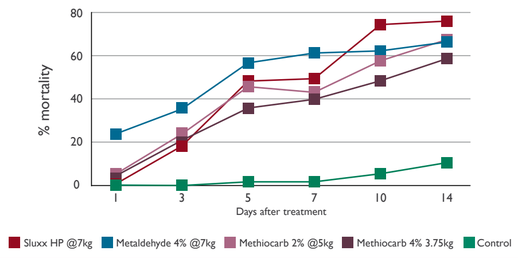
Efficacy in cabbage: % Mortality

Source: W. Neudorff GmbH KG.



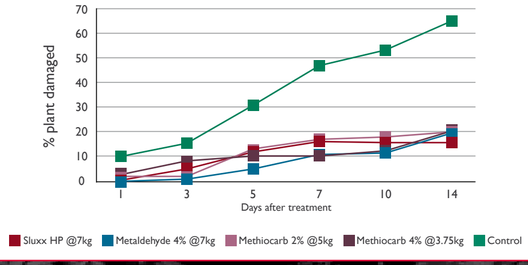
Caged arena trials: % Mortality

Source: Certis Europe.



Caged arena trials: % Plant damage

Source: Certis Europe.



Efficacy against small and juvenile slugs

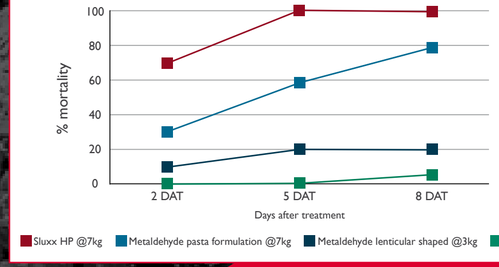
Contrary to popular belief it is not the largest slugs that have the greatest potential to damage crops. Small/juvenile *Deroceras spp.* (opposite) are particularly active feeders and are highly damaging to a whole range of crops.

The trial below demonstrates Sluxx HP is very effective against small/juvenile slugs.



Efficacy against small/juvenile slugs: % Mortality

Source: W. Neudorff GmbH KG.

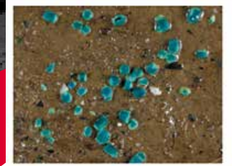


Pellet durability

Sluxx HP is a unique wet extruded durum wheat formulation designed to provide a rainfast solution for farmers and growers.

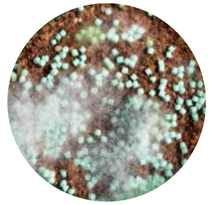
Extensive testing has demonstrated that Sluxx HP can withstand at least 50mm rain and still be lethal to slugs. The pellets initially take up moisture and expand but, once dried out, reform to their original shape. The overall length of persistence depends, as with any pellet, on the overall amount of moisture in the environment.

Under high levels of continuous rain or in irrigated crops, repeat applications may be necessary and can be applied as long as the maximum total dose of 28kg/ha/crop is not exceeded.



Sluxx HP

Moulding: Reduced occurence of mould



Control



Sluxx HP

Pellet stability in wet and wet/dry/wet… conditions

Samples of three different 'pasta' based products were put into petri dishes in the laboratory and subjected to two different treatment regimes with fixed amounts of water.

One where the pellets were kept continuously wet and another where the pellets were allowed to dry out in-between re-wetting - designed to simulate actual weather conditions.

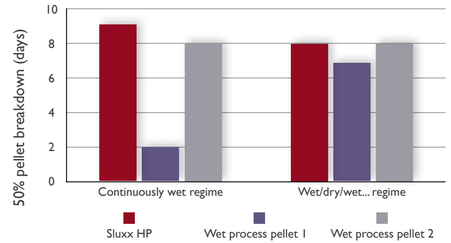
In each regime the number of days taken for 50% of the pellets to break down was measured.

The results below demonstrate that, in this study, the longevity of Sluxx HP in the wet/dry/wet regime was eight days for 50% breakdown - as good as the other products tested.

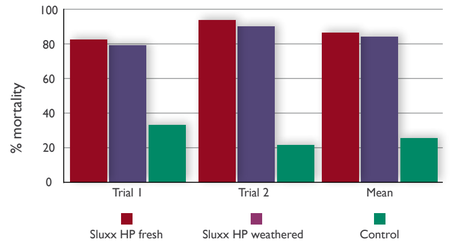
Laboratory tests replicating extreme temperature and humidity conditions, 22°C and 100% respectively, have also shown that Sluxx HP has excellent resistance to mould in comparison to other products tested.

Pellet stability: Pellet breakdown

Source: Certis Europe.



Pellet efficacy after 7 days (infestation 80 slugs/sqm) Source: W. Neudorff GmbH KG.





Pellet attractiveness

Slug pellets need to remain lethal but attractive for slugs to eat even when they have been applied for some days.

Trials were carried out to compare the relative attractiveness of fresh pellets with those that had been weathered for 7 days. Results in the graph (left) demonstrate that there is no difference in efficacy and that Sluxx HP remains both attractive to slugs and effective.

Formulation

Sluxx HP is an attractive food source for slugs and the unique, patented formulation produces a high quality, evenly sized pellet that spreads easily with minimum dust.

Laboratory studies have demonstrated that slugs are random feeders and encounter sources of food by chance. Consequently, it is important to ensure there are enough baiting points/m^2 to give adequate protection of the crop. Sluxx HP provides the following number of baiting points.

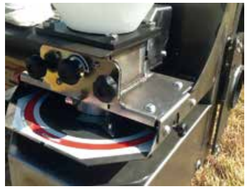
Dose rate/ha	Approx. number of pellets/m^2
7kg	66
5kg	47

Spreading

An even spread pattern gives the best results. Sluxx HP has been tested in the UK and Germany using a range of popular spreading machines. The high density of the pellets enables them to be spread evenly up to 36m, within the crop while maintaining the integrity of the pellet.

As with any slug pellet, care should be taken, when using single spinning disc applicators in particular, to ensure that the applicators are working correctly and that operators adhere to the manufacturers recommendations.

Before application, all equipment should be checked and calibrated correctly to spread Sluxx HP to the width required.



Stocks DUO before



Stocks DUO after spreading one bag of Sluxx HP

Environmental impact

The active ingredient in Sluxx HP, ferric phosphate, is virtually insoluble in water. It is however broken down in the soil. So, when Sluxx HP eventually biodegrades, it releases iron and phosphate into the soil which are then available as plant nutrients. It should be noted that Sluxx HP contains no EDTA.

There is no adverse aquatic environmental impact from the use of Sluxx HP, but it is a label requirement that pellets should not be allowed to enter water courses.

Ferric phosphate, the active ingredient within Sluxx HP, has low impact to other non-target organisms such as mammals, insects, earthworms, bees and birds. Toxicity studies on the product show that Sluxx HP has exceptionally low impact on all other non-target species as can be seen in the summary table below.

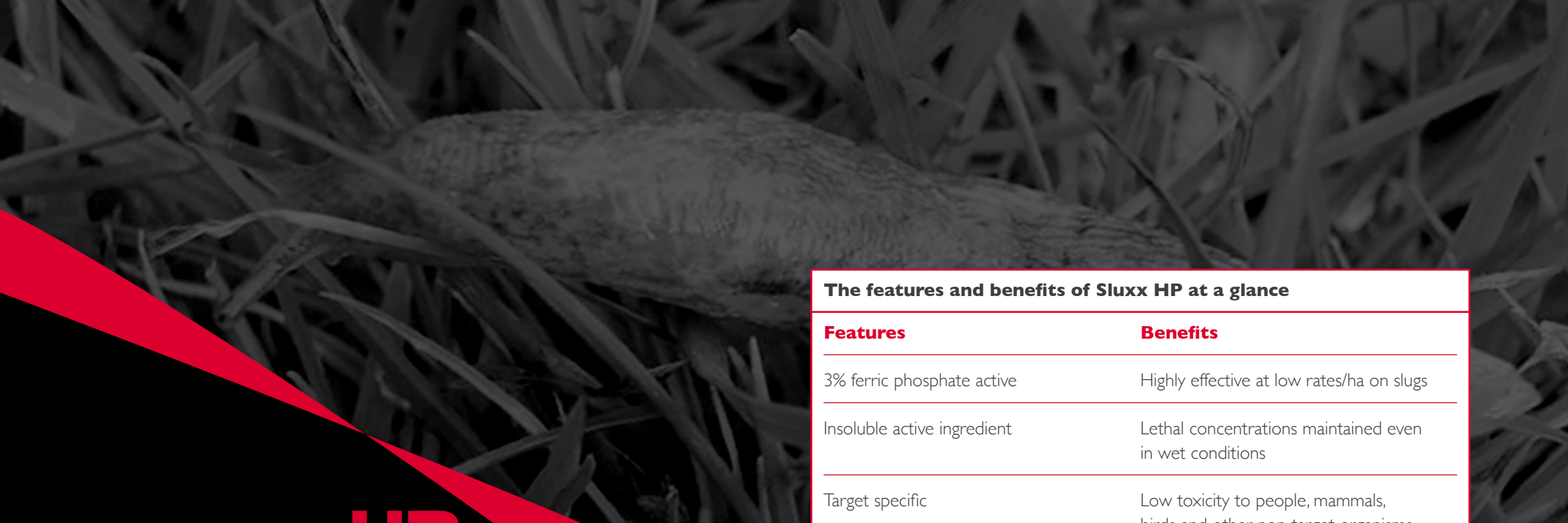
Toxicity studies: Human

	Results
Acute oral toxicity	LD50 > 5000 mg/kg
Acute dermal toxicity	LD50 > 2000 mg/kg
Eye irritation	Non-irritant
Skin irritation	Non-irritant

Toxicity studies: Ecological

Study	**Results**
Acute oral toxicity Bobwhite quail	LD50 and NOEL* > 5000 mg/kg
Acute toxicity earthworms	LD50 > 1000 mg/kg
Acute toxicity to the ground beetle *Poecilus cupreus***	No effect on *Poecilus* at max. application rate
Acute toxicity to the beetle *Aleochara bilineata***	No effect on *Aleochara* at max. application rate

*No observed effect level **Ground beetles are natural enemies of slugs, they consume eggs of slugs



SLUXX® HP
HIGH PERFORMANCE

For further information on SLUXX HP contact your distributor or the Certis technical hotline 0845 373 0305

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USE PLANT PROTECTION PRODUCTS SAFELY. ALWAYS READ THE LABEL AND PRODUCT INFORMATION BEFORE USE.
SLUXX HP AND SLUXX CONTAINS 3% FERRIC PHOSPHATE.

CERTIS PROGEMA®

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The features and benefits of Sluxx HP at a glance

Features	Benefits
3% ferric phosphate active	Highly effective at low rates/ha on slugs
Insoluble active ingredient	Lethal concentrations maintained even in wet conditions
Target specific	Low toxicity to people, mammals, birds and other non-target organisms (eg. worms and slug feeding beetles)
Active ingredient occurs naturally	Degrades into plant nutrients
Highly attractive formulation	Slugs are attracted to feed on the pellet instead of continuing to damage the crop
Acts as a slug stomach poison	Rapid cessation of feeding and no recovery therefore crop damage is minimised
No residues and zero harvest interval	Flexibility with timing
Approved for use on all edible and non-edible crops	No crop restrictions. High level of crop safety
High number of baiting points	Opportunity for optimum pellet to slug balance. 7kg delivers approximately 66 pellets/m^2