slugcontrol

A grower's guide

cpm

A De Sangosse booklet produced in association with *CPM*

DE SANGOSSE

Introduction

Contents

Slugs remain arable farming's number one pest. Their propensity to cause damage and to confound control methods is arguably one of the most frustrating aspects of crop establishment.

It's also the case that no one means of control will bring populations in check. The best strategy requires an integrated approach that can react to changes in the weather. A keen understanding of the pest itself is required as, unlike other pests, slugs must be drawn towards the pellet that will kill it.

These challenges are hard enough, but slug control is now made all the more difficult as a result of increasing regulatory restrictions on the use of slug pellets.

That's why CPM is pleased to support this technical guide that's been compiled by De Sangosse. Over the following pages, it describes the key species of slugs, their habits and field conditions they prefer. It looks at the crop damage caused and ways to reduce the risk.

There's an emphasis on an integrated approach and the guide has drawn on assistance from Väderstad in picking out elements of cultivation and seedbed preparation. The aim is to bring best results in terms of a seedbed that enhances crop growth and that presents a slug with a hostile environment. How best to apply a pellet and the importance of pellet design is explored.

The threat from slugs will continue, and the challenge to keep them under control will likely increase. But a keen understanding of the pest, what tools to use and how is the best resource growers have to tackle it, which is what makes this guide one worth hanging on to.

Tom Allen-Stevens, Editor, CPM

Understanding slugs

Life cycles

Slugs and snails have soft bodies covered in watery mucus and they lose moisture rapidly under dry conditions. Snails survive dry conditions by withdrawing into their protective shells and sealing the mouth of the shell.

Slugs have lost this protective outer shell, but as a result they have pliant bodies that can change shape to squeeze through small cracks and crevices to find food and to shelter in damp dark places during unfavourable conditions. This gives slugs the ability to move through soil and damage crops below as well as above ground.

Slugs are hermaphrodite, so every individual in a population is capable of laying eggs (up to several hundred each). Most species normally mate with another individual before laying fertile eggs.

Movement activity

Slugs are dependent on temperature and moisture for activity. Their outer body surface is permeable to moisture and is covered by a layer of watery mucus (greater than 90% water). They also move on a layer of special sticky mucus, which is laid down in a carpet by the cells of the foot. Slugs glide forward on this layer by muscular contractions, leaving behind characteristic mucous trails.

Slugs typically hide during the day in cracks and crevices in the soil and peak activity is around dusk, and then again at dawn.Some species such as the grey field slug and the larger round-backed slugs (see next section) can be active on and above the soil surface during the day in humid, dull conditions.

Slugs and snails use the two pairs of tentacles on their head in order to find food.

Slugs are hermaphrodite, so every individual in a population is capable of laying eggs.

How slugs find food

Slugs use the two pairs of tentacles on their head in order to find food. Sensory cells on the large upward-pointing posterior tentacles smell food from a distance, while the smaller anterior tentacles are used to touch and taste potential food items. If acceptable, the slug uses its radula (tongue with backward pointing teeth) to break off pieces of food and swallow them.

A slug's outer body surface is permeable to moisture and is covered by a layer of watery mucus.

Slug species

Knowledge of the slug species in the UK has increased greatly in recent years, with names revised and several new species added.

Grey field slug

The grey field slug *(Deroceras reticulatum)* is often found in arable crops. It is the commonest and most widespread species, and is very active on the soil surface and on green vegetation. On dull, humid days, it will even be found up in the crop canopy. Its body colour is very variable, ranging from white through oatmeal (often with darker flecks) to grey or even black.

The grey field slug is the commonest and most widespread species in arable crops.

It is fast growing and can complete its life cycle in less than a year. It often shows peaks of egg laying in spring and autumn, but in a wet summer it can breed throughout the summer, when temperatures are close to the optimum for development (17°C).

Spring-hatched slugs become adults and lay eggs by late summer or autumn, but eggs hatched in autumn do not become adults until late spring or summer the following year. Eggs laid in a wet summer hatch in about two weeks and can give rise to large populations of hungry, rapidly-growing juveniles by late summer and autumn, ready to attack winter cereals and oilseed rape at establishment.

Round-backed slugs

Round-backed slugs (*Arion* species) are typically found together with grey field slugs in arable fields. Garden slugs (mostly *Arion distinctus* and *Arion hortensis*) are the most important pests for arable farmers. These are small blackish slugs with bright orange soles.

Arion hortensis *is one the most important pests for arable farmers.*

Garden slugs lay eggs from spring to early summer. Juveniles hatch and grow through the summer but they are mainly subterranean and unlikely to be seen at this stage of their development, even in damp weather. They become more active on the soil surface as they approach maturity in autumn, winter and early spring.

Some larger round-backed species are more active on the soil and on vegetation than garden slugs. With the exception of *Arion subfuscus* (the dusky slug) these larger species are relatively uncommon in arable fields, except at field edges, where species such as the great red slug (*Arion rufus*) and the Spanish slug (*Arion vulgaris*) can

*The Spanish slug (*Arion vulgaris*) can be seen in field margin vegetation.*

be seen in field margin vegetation especially on damp days in summer and early autumn. They hatch from eggs in autumn or spring and grow through spring and summer to become adults and lay eggs again in the following autumn.

Keeled slugs

Keeled slugs such as the Budapest slug (*Tandonia budapestensis*) and the smooth jet slug (*Milax gagates*) are more localised in their distribution in arable fields than other pest slugs. They are also the most subterranean in their habits. This means that they can be difficult to find even when they are numerous.

They are a particular problem in potatoes and root crops, but also in winter wheat at establishment. Like garden slugs, juveniles are rarely seen on the soil surface. They become more surface-active as they mature and are most likely to be found in slug traps in mild, damp autumn or winter weather.

*The smooth jet slug (*Milax gagates*) is more localised and also one of the most subterranean in its habits.*

Crop impact

Winter cereals

Winter wheat grown in heavy clay or silt soils is most at risk from slugs. Weather and soil conditions can make it difficult for farmers to achieve satisfactory control in heavy soils.

Drilled wheat seeds become attractive to slugs as soon as they have taken up water from the soil. If slugs are able to gain access to the seeds, they destroy the growing point and thus always kill the embryo.

Slugs will often also consume some or all of the endosperm, causing characteristic seed hollowing. However, the amount of each individual seed eaten is irrelevant for crop establishment: the growing point has been destroyed and the seed will not germinate even if the damage appears slight and is not immediately obvious to the naked eye. Slugs also feed on the shoots as they grow up to the soil surface as well as on the roots.

They then feed on leaves after emergence (especially the grey field slug), causing characteristic leaf-shredding. Wheat seedlings remain vulnerable to slug damage up to the start of tillering.

Other winter cereals such as barley and oats are at less risk of slug damage compared with winter wheat, partly because the seeds of barley and oats have an extra seed coating, which makes it more difficult for slugs to feed on the embryo.

However, barley and oat shoots and leaves can suffer severe damage. The risk depends partly on the crop rotation: winter wheat is normally grown after oilseed rape, making it highly vulnerable.

Slugs can move readily through coarse, cloddy seedbeds to find and kill wheat seeds. They are less mobile in a fine seedbed. Where seeds have been drilled into coarse, cloddy seedbeds it is usually possible to reduce damage risk by drilling a little deeper than normal and by rolling the seedbed as soon as possible after drilling.

Slugs will often consume some or all of a seed's endosperm, causing characteristic seed hollowing.

Wheat seedlings remain vulnerable to slug damage up to the start of tillering.

Spring cereals

Spring cereals are normally at less risk of slug damage than winter cereals, due to having a more rapid growth habit at the early vulnerable phase when weather conditions are generally drier. However, the damage risk is dependent on all these factors and in a wet spring following a mild autumn and winter, the risk can be high.

Winter oilseed rape

Oilseed rape varieties low in glucosinolates are most at risk of slug damage. The seeds are not at risk until they start to germinate. However, the young seedlings are highly vulnerable because the seedling growing point and seed leaves (cotyledons) can be rapidly destroyed by slugs as soon as they emerge from the seed on the hypocotyl. The first indication of slug damage may be an apparent failure of the crop to germinate.

Slugs continue to feed on oilseed rape as it grows but the risk of severe damage reduces as the plants grow in size and the crop is no longer at risk when it has reached four true leaves. However, the crop provides slugs with an excellent source of food and shelter throughout the growing season and even after harvest. This often results in large increases in slug populations in oilseed rape with a consequent high risk of damage to the following crop of winter wheat.

Young OSR seedlings are highly vulnerable because the seedling growing point and cotyledons can be rapidly destroyed by slugs.

Potatoes

The main period of vulnerability of potato crops to slug damage is when the crop approaches harvest and slugs move through the soil to feed on the tubers as they mature. Typically, a slug makes a small entry hole through the skin then hollows out a larger chamber in the flesh of the tuber underneath.

The actual loss of yield is small but the loss of crop quality is economically important. Because slugs feed below ground on potato tubers, it can be difficult to achieve satisfactory control so it is essential to apply slug pellets to kill slugs before they have started to feed on the tubers. Harvesting potatoes in early September also reduces damage by restricting the time that tubers are at risk of slug damage.

Vegetables

Slug damage in vegetables can be significant and losses are estimated to be in the region of £8M per season. Apart from crop losses, contamination from slime and faeces can reduce the marketability of crops and the presence of live or dead slugs can lead to a full rejection.

Winter wheat is normally grown after oilseed rape, making it highly vulnerable.

Environmental influences

Moisture and temperature

Slugs are highly dependent on moisture for their survival, activity and growth. They are most active in damp, humid conditions. Light rain increases their activity but heavy rain can reduce surface activity because the rainfall washes away the protective mucus. Strong winds also increase the rate of moisture loss from the body surface and slug activity is reduced as a result.

Temperature is also important. Provided that moisture is not limiting, the optimum temperature for slug activity is around 17°C. The lower limit for activity is around 5°C for most species, but grey field slugs can be active even around 1°C.

Slugs are most troublesome as pests in heavy clay or silt soils.

Soil type

Slugs are most troublesome as pests in heavy clay or silt soils. These soils retain moisture, thus increasing slug survival and it is difficult for farmers to produce fine seedbeds under wet or dry weather conditions. Lighter soils tend to have fewer slug problems. However, in a wet year, slug numbers can build up quickly even on lighter soils resulting in severe damage or even crop failure in fields where slugs are not normally considered to be pests.

Crop residues provide slugs with valuable food and shelter and increases moisture retention.

Crop residues

Previous cropping plays an important role. Dense, leafy crops allow slug populations to build up rapidly during the growing season, resulting in a greatly increased risk of damage to a following crop; especially winter wheat following oilseed rape.

When crop residues are left in the field, this provides slugs with valuable food and shelter and increases moisture retention. Addition of any form of organic matter, e.g. manure, also increases the risk of slug damage for the same reasons.

The presence of vegetation (volunteers, weeds or a cover crop) in the period between harvesting the previous crop and drilling the next also provides slugs with valuable food and shelter, increasing risk to the following crop.

Planting date

Planting date has a direct impact on slug pressure because, as establishment is delayed later into the autumn months, conditions swing in favour of the pest.

As the autumn progresses, slug populations begin to increase and conditions tend to become wetter and cooler, so more suitable for slug activity, while at the same time crops take longer to grow through the critical early stages.

However, this general trend of increasing risk later in the autumn is highly weather dependent and wet weather in early autumn can result in severe slug damage to even early-sown crops, particularly since earlier drilling tends to be made following oilseed rape.

As establishment is delayed later into the autumn months, conditions swing in favour of the pest.

An integrated approach (IPM)

Trapping

Slug trapping is a valuable way for farmers and agronomists to gauge the size of slug populations in different fields as the first step in evaluating damage risk. If trapping is done over successive years in the same fields, it is possible to gain an understanding of how risk of damage fluctuates between seasons depending on previous cropping and recent weather. However, slug trapping needs to be done when the weather and agronomic conditions are suitable for slugs on the soil surface otherwise slugs will not enter the traps or will leave the traps as freely as they enter.

Traps consist of a cover placed on the soil surface to provide dark damp conditions, with a small quantity (about 10ml) of non-toxic bait placed underneath (chicken layers' mash is ideal). The cover can consist of an upturned plastic flowerpot saucer about 25-30 cm in diameter, or other type of cover.

DO NOT USE SLUG PELLETS IN THE TRAP.

Slug trapping is a valuable way for farmers and agronomists to gauge the size of slug populations.

Traps should be put in place:

- Before the soil is disturbed by cultivation (cultivation disrupts surface activity and trapping soon after cultivation can result in a gross underestimate of slug numbers);
- When the soil is visibly moist on the surface and in the top 10 cm of the profile and when the soil surface is likely to remain moist until the traps are examined the following morning;
- When the temperature is, and is likely to remain, in the range 5-17°C until traps are examined; and
- When the wind is light to moderate or when the traps are situated in sheltered places such as in a standing crop of cereals.

Traps should be left in place overnight and examined the next morning. If sunlight is likely to fall directly on the traps the next morning, then the traps should be examined early in the day before the traps heat up to a temperature that causes the slugs to leave. If the weather remains dull and damp the following morning, slugs will remain in place and the traps can be examined later in the morning.

Although length of chopped straw is important, so is the degree of laceration.

In cloddy seedbed, loss of seeds to slugs can be greatly reduced by increasing the drilling depth to 4-5 cm.

Pre-drilling management

Seedbed preparation is fundamental to non-chemical means of protecting crops from attack. Where ever possible, seedbeds should be fine and consolidated to make it difficult for slugs to pass through the profile and locate the seed. Good seed-to-soil contact will also aid establishment. After sowing the field should be rolled to break up clods and firm the seedbed. Achieving a suitable seedbed can be difficult on heavy soils.

Drilling practice

Where it is necessary to drill winter cereals into a cloddy seedbed, loss of seeds to slugs can be greatly reduced by increasing the drilling depth to 4-5 cm. In a cloddy seedbed the smaller soil aggregates inevitably fall down between the clods and drilling a little deeper in this way results in the seeds being more likely to be surrounded by fine soil.

This increases the rate of water uptake by the seeds giving faster germination while at the same time making it more difficult for slugs to attack the growing point. Slugs will still attack the shoots growing towards the soil surface, but this damage can be effectively reduced by an application of slug pellets to the soil surface.

Threshold limits

Average number of slugs/trap:	
Winter cereal	4
Oilseed rape (standing cereals)	4
Oilseed rape (cereal stubble)	1
Potatoes	1

Cultivation and seedbed preparation

The goal of cultivations is to destroy the slug habitat. To thrive, a slug needs moist conditions and protection from ultra-violet radiation.

Cultivations that aid slug control should aim to:
a. Distribute + mix in straw
b. Reduce clods
c. Reduce cavities.

Cultivation practices impact on slug numbers by mechanical damage, exposure to desiccation and to predators. Slug activity on the soil surface is also severely disrupted for several days after cultivation; a point to remember if using slug traps to evaluate damage risk.

In general, ploughing has a greater effect in reducing slug numbers than other non-inversion methods of tillage. However, ploughing does not necessarily result in a lower risk of slug damage because of the importance of seedbed conditions.

Slug damage prevention at crop establishment is achieved by making sure that seeds are drilled

Cultivating soon after the combine helps reduce slug numbers and weed seeds.

Two passes with a Carrier can reduce the surface slug population by 80% if it is done at the right time.

into seedbeds that closely cover the seeds. This hastens germination and prevents slugs from feeding on cereals or oilseed rape when they are at their most vulnerable. Thus it is more important to choose a method of tillage that provides a fine seedbed than to choose the method that gives the largest reduction in slug numbers.

Cultivating soon after the combine helps reduce slug numbers and weed seeds, which will take out the majority of the pests' source of food and shelter. Creating a fine but consolidated seedbed also helps to prevent slugs from feeding on seeds or seedlings and makes it harder for them to move about or find safe resting places.

A good reconsolidation paired with high working intensity is crucial to control slugs. The use of a heavy packer can eliminate hollows in the soil and fast drying topsoil is important to help dry out slug eggs and young slugs. Reduce clod sizes to take out hideaways for slugs.

A cultivator with a heavy packer is key. Väderstad manufactures cultivators that work to a range of depths, for example:

- Carrier – ideally for shallow cultivation just below seeding depth
- TopDown - A combination cultivator ideal for shallow or deep cultivation
- RexiusTwin – the heaviest of all the appropriate cultivators.

A good result can be achieved using a double SoilRunner and SteelRunner to give good reconsolidation and high working intensity. The heavy packer eliminates hollows in the soil, which is where slugs will hide. Producing a fine seedbed encourages the soil surface to dry out, which in turn dries out slug eggs and juveniles.

To kill slugs and destroy their eggs require perfect timing of appropriate cultivations. Two passes with a Carrier can reduce the surface slug population by 80% if it is done at the right time, for example. It is most effective if slugs are in the top soil (moist soil) so the key for controlling slugs using cultivations is to carry these out in the morning or in humid soil. Travelling at speed is essential to achieve good mixing and cause maximum slug disruption.

When cultivating stubbles directly after harvest for the first time go shallow, but mix and spread straw and residues to avoid straw mats. The mechanical action of turning soil and mixing trash will kill slugs and remove their habitat as well as dry out topsoil, and minimise clods for hiding under.

A second cultivation two weeks after the first is a belt and braces approach to slug control using mechanical means.

Cultivating oilseed rape stubbles is essential as they are a good place for slugs. The Carrier's CrossCutter Knife as well as the CrossCutter Disc are the most appropriate tools for destroying stubbles and can provide the same quality finish as that achieved by using a rotary cutter. The quicker the oilseed rape can be broken down the quicker an essential food supply for slugs can be removed.

An additional pass after drilling is often necessary and is best served with a roller such as a Rexius or Rollex, which can effectively control slugs by taking out cavities and holes in the soil and also break up stubborn clods on the top. It is also possible to spread slug pellets while rolling, which removes the need for an additional pass.

The advantage of a second cultivation is that the surviving slugs will have already re-orientated themselves after the previous cultivations/drilling, which should result in a better uptake of pellets.

The CrossCutter Knife is an appropriate tool for destroying stubbles.

Slug pellet application

There are a number of ways to apply pellets and this depends on preference:
1. With the drill spread behind
2. On a Cambridge roll
3. With a fertiliser/pellet spreader

Applications of slug pellets should be based on the risk of attack. If slug numbers in traps are above the threshold for a particular field of cereals or oilseed rape, and if the weather and soil conditions are conducive to slug attack, then it is important to apply pellets before damage is seen.

If application is delayed until the first damage is visible, it may already be too late to save the crop. Pellets can be applied shortly before drilling, provided that the pellets can be left undisturbed for a few days before drilling. However, if weather is suitable for drilling, it is not worth delaying drilling. An application of pellets on the soil surface soon after drilling and rolling is likely to be the best practical option to prevent severe slug damage to cereals and oilseed rape.

The Väderstad BioDrill is a mountable small seeder that can be fitted on a number of cultivators and seed drills, further improving the machine's versatility. It is equipped with a precise radar-controlled metering system, ensuring an even distribution over the entire working width. This accuracy is fully measurable to a full-scale seed drill – important when drilling low seed rates or applying slug pellets. A BioDrill is often fitted to Rollex and Rexius rollers to further consolidate the soil after seeding prior to slug pellet application.

Fitting the BioDrill to the Rexius and adapting the applicator for slug pellets is a simple operation. The rollers can be fitted with a new spreader plate which provides an exact and even distribution over the entire working width. To offer high versatility, the spreader plate can be easily configured into two different setups by mounting it behind the packer, which helps to spread slug pellets together with the roller operation in one pass (see picture opposite).

The Rexius can be equipped with the Cambridge HeavyDuty packer, which increases the capacity and ensures that the seeds make good contact with the soil, while also pressing down stones from the surface into the soil.

The Cambridge HeavyDuty packer increases the weight of the machine to 7380kg, and the diameter of the packer is 57cm.

The Biodrill can also be fitted to the Rapid and Spirit drill, which is ideal for distributing slug pellets after drilling in one pass. It is essential to cultivate the soil, drill and consolidate soils before distributing slug pellets.

Seeds drilled into a fine, consolidated seedbed, will reduce damage by slugs to the seeds or seedlings before emergence. In a cloddy seedbed the seed must be drilled slightly deeper than in the fine soil to give them more protection.

Placing the seed into a well consolidated area provides good seed to soil contact, which enables the seed to germinate and grow rapidly. This in turn reduces the window in which a slug can damage the crop.

Applicator Testing

It is now a legal requirement to have all vehicle mounted pesticide application equipment tested by NSTS (National Sprayer Testing Scheme) who have been delegated to test equipment in the UK.

To satisfy the SUD (Sustainable Use Directive), machines must be tested by 26 November 2020 and thereafter every three years. Some specialist equipment – those listed in Annex 4 of the National Action Plan – require re-testing every six years.

Testing slug pellet applicators helps ensure that machines are capable of applying product accurately and on-target and that the applicator is safe for the operator and the environment.

The BioDrill can be fitted on a number of cultivators and seed drills.

The design of the spreader plate ensures a precise and even distribution over the entire working width of the machine.

The Rexius can be equipped with the Cambridge HeavyDuty packer, which ensures that the seeds make good contact with the soil.

Pellet design

Slug pellets may look similar, but there are subtle differences between them that greatly influence performance.

There is no substitute for pellet quality. Used appropriately slug pellets can deliver exceptional levels of control, but modern crop rotations and the pressure to maximise farm profitability can make controlling slugs a challenge.

The increased frequency of oilseed rape in many rotations, a failure to adequately tackle volunteers or address cloddy or loose seedbeds before new crop establishment and the adoption of non-inversion cultivation techniques have led to an increasing reliance on chemical control.

Such situations raise the importance of pellet choice. It can be the difference between effective control and crop failure.

Slug pellets may look similar, but there are subtle differences between them that greatly influence performance. Slugs are the only pest in agriculture that will locate bait and consume it in sufficient quantity to achieve control. Compromise on pellet design or formulation and the impact on performance can be significant.

Feeding stops almost immediately after consuming ferric phosphate and the pest will retreat underground before death occurs.

Wet process durum wheat

Wet process pellets, such as those produced by De Sangosse, benefit from the ingredient being mixed into a paste and extruded that means the formed pellets are of a uniform size, shape and density. This ensures the pellets spread evenly and consistently across the treated area while the tight surface slows moisture ingress helping to promote persistence and avoid the need for

repeat applications. The use of durum wheat flour also ensures the pellet is highly palatable. This promotes bait consumption and all but guarantees death will follow.

When choosing a bait ensure that the quality is foremost on the mind and always choose durum wheat pelleted bait.

Active substance

Currently there are two modes of action available: ferric phosphate and metaldehyde. The substances differ in the manner in which they perform.

Metaldehyde works by perforating the mucus-producing cells thereby preventing the slug from moving or feeding. It is effective in only a short period of time which is why dead slugs are readily found on the soil surface after only a few hours following application.

Ferric phosphate by contrast works by impairing the digestion process and ultimately the ability of a slug to process food. Ingestion of pellet leads to vital organs being overloaded with iron, resulting in death. Feeding stops almost immediately and the pest will retreat underground before death occurs, meaning the carcasses will not be seen and therefore the effects can be less visible.

Pellet Dynamics

Not all pellets deliver the same performance under field conditions. Identifying the most suitable pellet for the situation requires an understanding of how manufacturing process and size effect performance and an appreciation for how the pest interacts with the bait.

Slugs are discriminate feeders and so poor quality pellets tend to have a low palatability score and are therefore less cost-effective. Slugs that have taken in only a sub-lethal dose from a poor quality pellet are likely to be bait-shy from then onwards and even more difficult to control.

De Sangosse pellets contain researched and unique attractants to entice the slug to the bait. It also uses high-grade durum wheat flour to deliver high palatability scores which ensures the slug consumes sufficient active ingredient to cause death.

Pellet size

After method of manufacture, size is the most important feature determining pellet performance. It gives the pellet mass, which supports its ballistic profile and determines spreading distance. It is also influences persistence because smaller pellets break down faster in the environment.

Size gives a pellet its weight and therefore ballistic properties – effective control can be achieved with as few as 30 pellets/m².

Small pellets enable more baiting points per square metre, but while it might seem advantageous to have more pellets per given area it means an increase in pellet surface area and a reduction in individual pellet mass. In reality, the smaller the pellet the less the spreading width and the faster it will break down in the environment.

Numerous studies have sought to identify the optimum number of baiting points per square metre, but with conditions, and therefore slug pressure, so variable between sites, there's no easy answer. Studies have, however, identified a range that gives reliably good control across a range of situations. Effective control can be achieved with as few as 30 pellets/m².

Application timing

More important than baiting points however, is application timing. Experience has shown that timely application just before the crop becomes vulnerable and pellet quality are the determining factors in achieving effective control, not the distance by which the slug has to travel to locate the bait.

Slugs must be enticed to consume the bait rather than the crop so using durum wheat flour ensures the pellet is highly palatable.

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