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TECHNICAL CUSTOMER UPDATE

Hot Weather and Harrowing: What the Research Says

Evidence-based guidance on pasture harrowing for parasite control during hot weather conditions.

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Why This Matters Now

With temperatures across the UK reaching sustained highs this summer, many of you have asked whether now is the right time to harrow paddocks as part of your pasture management. It is an important question, and we want you to have the evidence so you can make informed decisions alongside your Intelligent Worming programme.

Harrowing can be an effective tool for reducing parasite larvae on pasture, but **only when the conditions are right.** Done at the wrong time, harrowing spreads viable parasites across clean grazing, making the problem worse.

The Science: Three Factors, Not One

A common misconception is that heat alone kills parasitic larvae. In reality, the research shows that effective larval destruction requires **three factors working together:**

1. **Desiccation** (drying out of the faecal material and its contents)
2. **UV radiation** (direct sunlight on exposed larvae and eggs)
3. **Sustained heat** (ambient temperatures above 30°C for multiple days)

Krecek and colleagues (2008) demonstrated that when cyathostomin larvae in horse faeces are exposed directly to dry conditions:

PARASITE STAGE	TIME TO DEATH UNDER DIRECT DESICCATION
Preinfective larvae (L1/L2)	Killed within **1 minute**
Eggs	Killed within **5 hours**
Infective larvae (L3)	Survived 35 days in desiccated state; significant mortality after **3+ days continuous desiccation**
L3 exposed to desiccation + UV combined	**Total mortality within 5 days**

This is the principle behind effective harrowing: **breaking up the faecal pat removes the protective moisture reservoir** that would otherwise shield eggs and larvae, exposing them to both desiccation and UV radiation simultaneously.

Temperature Thresholds

The comprehensive review by Nielsen, Kaplan and colleagues (2007) in The Veterinary Journal, along with laboratory studies by Rupasinghe and Ogbourne (1978) and Mfitilodze and Hutchinson (1987), established the following thresholds for equine strongyle free-living stages:

TEMPERATURE	EFFECT ON STRONGYLE LARVAE
Below 6°C	No development occurs; eggs and larvae survive dormant
10 to 25°C	Eggs develop to L3 in 2 to 3 weeks (normal rate)
25 to 33°C	Rapid development: eggs to L3 in as little as 4 days
Above 35°C (dry)	Free-living stages begin to die off; survival rates drop to 1 to 10%
Above 38°C	Minimal or no larval development (Mfitilodze & Hutchinson, 1987)
Above 40°C	No development at all (upper lethal limit)

A Critical Cautionary Finding

A 2022 Swedish study (Osterman Lind and colleagues, published in Animals) directly tested harrowing as a parasite reduction strategy. The results were sobering:

> **Harrowing at temperatures between 14°C and 25°C in dry conditions did not significantly reduce larval counts on pasture.**
>
> The temperatures were simply not high enough. At the same site, twice-weekly faecal removal was highly effective.

This is the only published study to directly test harrowing for equine parasite control, and it demonstrates clearly that moderate summer temperatures (the mid-teens to mid-twenties) are not sufficient to make harrowing effective. The faecal material must be exposed to sustained heat well above 30°C combined with dry conditions and direct sunlight.

Sward Height: Why You Should Mow Before You Harrow

Even when the temperature and weather conditions are right, the height of your grass can determine whether harrowing actually works. **The whole point of harrowing is to expose broken-up faecal material to UV radiation and desiccation.** If the grass is tall, the canopy creates a shaded, humid microclimate at ground level that shields the material from sunlight and traps moisture. This is exactly the environment that protects larvae rather than killing them.

What the research shows

English (1979) studied larval distribution on vigorous pasture and found that the majority of strongyle larvae remained in the lowest layers, **within 10 cm of the soil surface.** Very few reached the upper portions of the sward. Langrova and colleagues (2003) confirmed this pattern, finding that **89% of cyathostomin L3 remained within 10 cm of the faecal pat.** Larval migration was driven almost entirely by moisture, with significant migration occurring during dew and negligible migration during dry conditions.

A 2021 Brazilian study comparing larval recovery in shade versus direct sunshine found that **significantly more larvae survived in shaded areas.** Tall grass provides exactly this kind of shade at the base of the sward where the larvae concentrate.

> **Practical threshold:** Taller grass retains dew and surface moisture for longer, extending the moist conditions that larvae need to survive. Below 10 cm (4 inches), UV and airflow reach ground level effectively. Above 15 to 20 cm (6 to 8 inches), the canopy creates sufficient shade and moisture retention to significantly reduce harrowing effectiveness.

SWARD HEIGHT	HARROWING EFFECTIVENESS
Below 10 cm (4 inches)	**Optimal.** Good UV penetration and airflow to ground level. Broken-up faecal material fully exposed.
10 to 15 cm (4 to 6 inches)	**Workable.** Some canopy shading at the base, but in very hot, dry, sunny conditions UV still reaches ground level adequately.
15 to 20 cm (6 to 8 inches)	**Unlikely to be effective.** Canopy creates significant shade and moisture retention at the base.
Above 20 cm (8 inches+)	**Do not harrow.** Dense canopy blocks UV almost entirely at ground level. Harrowing would spread viable parasites across a wider area with no kill.

> **Key recommendation: mow or top your paddock to below 10 cm before harrowing.** This ensures that broken-up faecal material is fully exposed to sunlight and air. Then harrow, then rest the paddock for at least one week. The mowing step makes harrowing effective rather than simply spreading contamination under a grass canopy.

When to Harrow: Evidence-Based Checklist

Conditions that must ALL be met:

- ✓ Sward height below 10 cm (4 inches). If grass is taller, mow or top the paddock first.
- ✓ Ambient temperature consistently above 30°C (ideally above 35°C) during daylight hours
- ✓ No rain forecast for at least 5 consecutive days after harrowing
- ✓ Strong, direct sunshine (not overcast)
- ✓ Horses removed from the paddock before harrowing begins
- ✓ Horses kept off the paddock for a minimum of one week after harrowing (longer is better)

Do not harrow if:

- ✗ Grass is above 15 cm (6 inches) and you cannot mow first
- ✗ Temperatures are below 25°C, even if the weather is dry
- ✗ Rain is forecast within 3 days of harrowing (rehydration allows larvae to survive)
- ✗ Conditions are overcast or humid (UV radiation is significantly reduced)
- ✗ Horses cannot be removed from the paddock (harrowing spreads larvae into grazing areas)

Practical Steps for Your Paddocks

1. **Check the 7-day forecast.** You need at least 5 consecutive dry, hot days (above 30°C) with sunshine ahead.
2. **Mow or top the paddock first.** Get the sward down to below 10 cm (4 inches) to maximise UV and airflow to ground level.
3. **Remove all horses from the paddock** before harrowing. This is non-negotiable.
4. **Harrow thoroughly** to break up all faecal pats and expose their contents to sunlight and dry air.
5. **Keep horses off the paddock for at least one week.** Allow desiccation and UV to do their work. If you can rest the paddock for longer, that is even better.
6. **Continue regular poo-picking** on your other paddocks. Harrowing is a complement to manual removal, not a replacement for it.

7 **Resume your normal programme.** Your IW parasite profile and risk assessment already accounts for pasture management. This is an additional step, not a change to your programme.

The Bottom Line

Harrowing is a valuable pasture management tool, but the evidence is clear: **it only works in genuinely hot, dry, sunny conditions sustained over several days, on short grass where UV can reach ground level.** Done at the wrong time or in the wrong conditions, you spread viable parasites across clean grazing. This is why your Intelligent Worming programme takes a whole-picture approach to parasite risk, including pasture management, rather than relying on any single intervention.

If you have any questions about whether conditions at your site are right for harrowing, or about any aspect of your programme, please contact us.

References

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