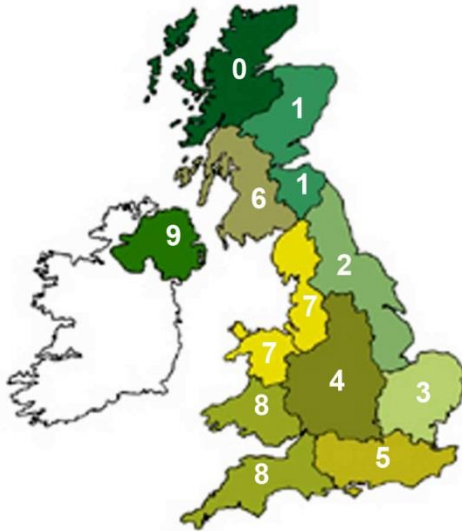


Use of meteorological data to predict the prevalence of parasitic diseases

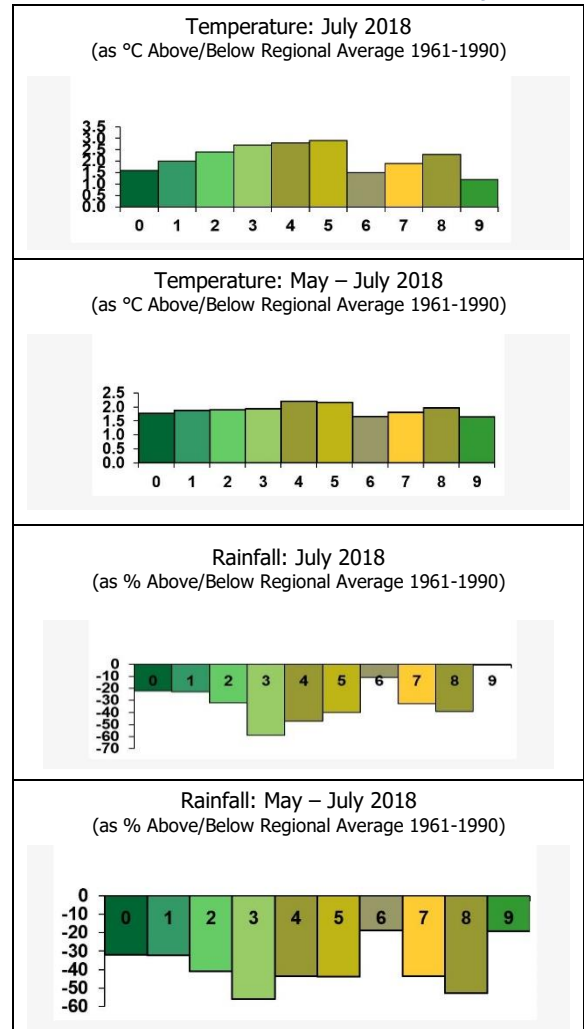
Regional Weather

(based on Met Office figures)



REGIONS

- 0 N W Scotland
- 1 E Scotland
- 2 N E England
- 3 E Anglia
- 4 The Midlands
- 5 S England
- 6 S W Scotland
- 7 N W England & N Wales
- 8 S W England & S Wales
- 9 N Ireland



The unseasonably hot, dry weather experienced over the summer months in 2018 has continued into July. The average temperature for the UK in July was 17.3 °C, 2.2 °C above the 1981-2010 long-term average, making it provisionally the joint second warmest July (alongside 1983, after 2006) in a series from 1910. These above average temperatures also extended to observed maximum and minimum temperatures, which were recorded as 1 – 4°C above the long term averages recorded across all regions of the UK. Combined average temperatures for the preceding 3 months (May – July 2018) were above average across all regions of the UK. Rainfall in the UK in July was recorded at 71% of average, with particularly dry conditions observed in parts of Norfolk and Cambridgeshire. Whilst still below the long term average for July, other areas of the Great Britain were less markedly dry, while the monthly rainfall in Northern Ireland was comparable to the long term average for the region. Combined average rainfall for the preceding 3 months (May – July 2018) were below average across all regions of the UK. Sunshine was 138% of average and it was provisionally the sixth sunniest July in a series since 1929, and sunniest relative to normal in England where it was provisionally the second sunniest July after 2006.

September Parasite Forecast/Update

The most recent version of this monthly parasite forecast may be accessed at www.nadis.org.uk.

Preliminary fluke forecast

The preliminary fluke forecast for 2018 was first published in July, and is based on rainfall and temperature data for the months of August-October 2017 and May-June 2018. This forecast predicts moderate to high risk in the north and west of Scotland, and low risk in most other areas (Figure 1). An updated forecast for Autumn 2018 will be produced later in the year based on temperature and rainfall data for May-October 2018.

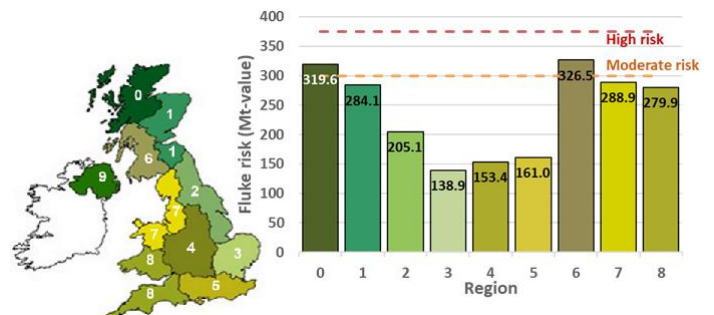


Figure 1: Provisional fluke forecast for summer 2018 by region. A risk value >300 is considered moderate. A risk value >375 is considered high. A more comprehensive risk forecast for Autumn 2018 will be produced later in the year.

Development of liver fluke and its intermediate host, the mud snail (*Galba truncatula*; Figure 2), on pasture is dependent upon temperature and rainfall with warm wet conditions optimal. The recent run of dry weather is therefore likely to reduce risk of liver fluke later in the season. However, as was the case for Northern Ireland in July, where above average temperatures and normal levels of rainfall are present the risk of liver fluke later in the season may increase. Similarly, on farms with permanently wet areas and/or permanent water bodies snails may continue to thrive in the hot weather (Figure 2). Consequently, in addition to the NADIS forecast, risk of fluke infection should be considered on a farm by farm basis, with local rainfall and wetlands taken into account.



Figure 2: A large number of mud snails (*Galba truncatula*) recovered from a farm in Lancashire, August 2018. While the current dry weather indicates lower risk for liver fluke consideration should be given to on farm conditions relating to local rainfall and wetlands. Photo credit: Bethan John, University of Liverpool.

Acute disease caused by fluke may occur at any time from late summer onwards. This type of infection is more common in sheep, with signs including:

- Sudden death in heavy infections
- General dullness, anaemia and shortness of breath
- Rapid weight loss, fluid accumulation

Advised actions include:

- Monitoring for signs of disease.
- Routine diagnostic testing to give a greater insight into the current infection:
 - Post-mortem in acute outbreaks.
 - Antibody ELISAs are available for testing individual sheep and cattle through blood sampling, or to monitor herd-level infection status in dairy cattle through testing bulk milk tank samples.
 - A faecal antigen test is also available for testing individual animals.
 - Worm egg counts can be used to diagnose infection in individuals, or groups of animals when using a composite sample, although these cannot be relied upon for the diagnosis of acute disease.
 - For more information on diagnostic options, please speak to your vet.
- Where acute disease occurs, treatment with triclabendazole is recommended as this is the only

product effective against both adult and immature stages of the parasite.

- It is also advised to test for treatment efficacy through pre- and post-treatment diagnostic testing. For more information about efficacy testing, please speak to your vet.
- Risk of infection can be reduced by identifying high risk fluke pastures and avoiding grazing these during peak risk periods.
 - Both sheep and cattle are susceptible to infection with liver fluke, meaning pastures previously grazed by either species should be considered a potential risk to the other.
 - Mud snails are generally found in damp, muddy areas.

Quarantine treatments

All animals coming onto farm should be considered a potential source of drug resistant worms. Where buying in new stock, as is the commonly the case in autumn, quarantine measures should be taken.

For sheep, current best practice advised by [Sustainable Control of Parasites in Sheep \(SCOPS\)](#) is as follows:

To prevent introduction of resistant roundworms and sheep scab:

1. Sequential treatments with either a 4-AD product (monepantel) or 5-SI (derquantel in combination with abamectin), and injectable moxidectin.
2. Hold purchased animals away from pasture for 24-48 hours post treatment, then turn out to "dirty" pasture previously grazed by sheep.
3. Maintain purchased stock separately for at least 30 days to monitor for disease before mixing.

Where resistant liver fluke is a concern:

1. Triclabendazole resistance is increasingly common in the UK. Assume that brought-in animals are infected with resistant liver fluke.
2. Hold purchased animals away from pasture, or on grazing free of mud snails (dry, well drained pastures) until at least 4 weeks after treatment.
3. Treat animals with either:
 - a. 2 doses of closantel, 6 weeks apart
 - b. 2 doses of notroxynil, 7 weeks apart
 - c. Alternative strategies using a combination of products may help prevent introducing resistance to any one particular flukicide. For more advice on this, please seek veterinary advice.

For cattle, [Control of Worms Sustainably \(COWS\)](#) guidelines highlight the importance of knowing disease status of purchased animals or their farm of origin.

1. For roundworms, particularly those infected with 3-ML resistant *Cooperia* and/or lungworm:
 - a. House animals on arrival and implement control measures ahead of turn out in spring.
 - b. Treat with effective anthelmintic. **N.B.** for 3-ML resistant *Cooperia* treatment with either a 1-BZ or 2-LV product is advised.
 - c. Test efficacy of treatments
2. For ectoparasites such as mites and lice, treat with a 3-ML or permethrin product to prevent spread during winter housing
3. For liver fluke, specific guidelines have been developed for bought in cattle based on the three basic principles of [HOUSE, TREAT and TEST](#).

SHEEP

Parasitic Gastroenteritis (PGE)

PGE is a disease of lambs in their first grazing season, resulting from the accumulation of large infectious burdens of gastrointestinal roundworms over the course of the grazing season. Typical signs include:

- loss of appetite
- diarrhoea
- dehydration
- weight loss (Figure 3)

Pasture contamination peaks over the summer months, falling off into the late summer and autumn. As reported above, the hot, dry conditions experienced over the preceding months are likely to have reduced disease risk by increasing larval mortality. However, certain animals, such as lambs with unknown worm burdens grazing “dirty” pastures may still be at risk.



Figure 3: Emaciation caused by failure to control PGE.

Advised actions include:

- Monitoring for signs of PGE.
 - Consider worm egg counts if infection status is unknown.
- For lambs currently grazing dirty pasture:
 - Dose and move at weaning to safe pasture (eg. silage aftermath) where available.
 - Leave animals on dirty pasture for 2-3 days prior to moving.
 - Aim to leave at least 10% of the flock untreated.
 - Where safe pasture is unavailable:
 - Use targeted selective treatments (TSTs) based on monthly live weight gain (Figure 4).
- Where anthelmintic treatments are administered, check efficacy through worm egg counts:
 - Re-test 10-12 individuals at 7-14 days post treatment depending upon the product used.



Figure 4. Regular weighing of lambs over the grazing season enables targeted selected treatment (TST) for animals which aren't meeting expected growth rates. This also facilitates accurate dosing by weight.

Haemonchosis

Due to the ability of female *Haemonchus contortus* worms to produce huge numbers of eggs, the potential for these to develop rapidly on pasture, risk of haemonchosis should not be ruled out based on recent weather. Cases are sporadic and difficult to predict, with a number of outbreaks have been reported over the summer months.

- Both lambs and ewes are considered at risk for haemonchosis.
- Acute disease is characterised by:
 - Anaemia, observable as pallor of the tissues around the eyes (Figure 5) and general fatigue.
 - Oedema or fluid accumulation, including bottle jaw.
 - Sudden death in heavy infections.
- Chronic infections may also occur, characterised by progressive weight loss, anaemia and loss of appetite.
- Given the signs described above, haemonchosis can appear similar to fasciolosis. Where in doubt, diagnostic testing can be used to distinguish further.

Most anthelmintic products are effective against haemonchus, although some evidence of resistance to white drenches (1-BZ) has been reported previously in the UK. Some flukicidal products, such as nitroxylnil and closantel are also effective.



Figure 5: In haemonchosis the most important clinical sign is anaemia.

CATTLE

Parasitic Gastroenteritis (PGE)

The recent hot, dry weather is likely to have decreased the survival of larvae on pasture. Larval pasture burdens for most cattle roundworms tend to peak in early to mid-July, although levels of *Ostertagia ostertagi* larvae can remain high until the end of the grazing season. Young stock in their first grazing season may therefore still be at risk of type-1 ostertagiosis, particularly if set stocked on permanent pasture. Animals should continue to be monitored for signs of disease and/or poor performance.

Advised actions include:

- Monitoring for signs of PGE:
 - Loss of appetite
 - Loss of weight and body condition
 - Profuse diarrhoea
- Continue targeted selected treatments based on liveweight gain, or faecal egg counts where weighing apparatus is unavailable.
- If not done already, move calves to safe grazing such as hay or silage aftermath where available.
- Where outbreaks of ostertagiosis occur treat all calves in the affected group.

Lungworm

Lungworm infection may continue to be a risk into the late grazing season. Larvae shed by already infected cattle may survive drier periods of weather within faecal pats to be dispersed onto pasture en masse following periods of rainfall. It is therefore advisable to continue monitoring for signs of disease in at risk animals such as unvaccinated calves in their first grazing season. Early signs of infection include:

- Widespread coughing in the group, initially after exercise then at rest.
- Increased respiratory rate and difficulty breathing (Figure 6).
- Rapid loss of weight and body condition.
- Milk drop in lactating cattle.
- Death in heavy infections.

Where infection is suspected treat animals with an anthelmintic (most products are effective) and remove affected cattle to "safe" pasture (e.g. aftermath) or house in a well ventilated building. Infection can be confirmed by post-mortem or detection of larvae in saliva or faecal samples. In lactating dairy cattle a milk sample antibody ELISAs is also

available. It is also important to consider milk withdrawal periods when treating these animals.



Figure 6. Early signs of lungworm infection include widespread coughing and elevated respiratory rates.

***Local farm conditions may vary so consult your veterinary surgeon.
Parasite control should be part of your veterinary health plan.***

NADIS hopes that you have found the information in this forecast useful. Now test your knowledge by attempting the quiz below. You will be emailed an animal health certificate for this subject if you attain the required standard.

Click here

Health Quiz



Supporting Knowledge Transfer

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