

Executive Summary

The current state of the insect population in grasslands remains uncertain, as we lack sufficient data. Moreover, there is growing concern about the emergence of resistance to wormers, which are known to negatively impact insect populations. Given these factors, it is critical to further study and monitor the health of insect populations in grasslands and carefully evaluate the use of wormers to mitigate potential harm. A significant number of participants reduced their dosage rates substantially and only administered dosing for lungworms instead of stomach worms. Our analysis revealed that this was primarily attributable to grassland management, FEC testing and weighing of livestock. Moreover, we discovered a thriving population of dung beetles on farms, which was particularly abundant around grazing cows as they moved from field to field.

Brief description of the project

To start the project we set about as a group in educating ourselves on biodiversity, Calf health, remedy usage, grazing strategies, FEC testing, weight targets etc. We ran training days, zoom calls, study tours, on farm training days with experts looking at these topics. We identified current best practices building a list of KPI's thus gaining confidence in what we were about to do.

Our EIP wanted to look at the level of biodiversity in dungpads on the fields of dairy farms. Therefore, we decided to do a baseline survey on a number of farms in the group spread across Laois.

Dosing animals for stomach worms has been shown to damage insect populations and we surmised this to be especially true for populations interacting with dung pads. We wanted to reduce the level of dosing on farm to promote insect populations while maintaining or improving animal health outcomes. Having done all this we came up with a dosing planner for our calves so that all members of the group could be confident that animal health wasn't compromised while also promoting biodiversity. Ultimately this was a win-win situation.

Briefly the group:

- Weighted calves at turn out to grass and weighted every calf every 6 weeks to ensure that they were reaching their target weight helping inform dosing strategy. A total of 3314 weighing events were recorded over the grazing season ensuring weight targets were met.
- Took faecal samples every month for each group of calves and sent them to the lab on an assigned day. These results were put up on a Whattapp group and discussed. When we do go over 250epg we need to worm our calves. With the arising issue of resistance we have to consider rotating products, as we are dairy farmers we are limited to using eprinomectin in our lactating cows, this is a clear wormer and

resistance to one clear wormer is quickly followed by resistance to all in that group. White wormers can not be used in lactating cows but some can be used on dry cows. Yellow wormers can be used in younger animals, but watch out for calving dates of heifers.

Breakdown of the FEC test results

Name	Results						
	05/05/2022	09/06/2022	06/07/2022	04/08/2022	07/09/2022	06/10/2022	04/11/2022
Farmer 1	Not Detected	Not Detected	50	Not Detected	Not Detected	Not Detected	Not Detected
Farmer 2	50	50	100	50	Not Detected	Not Detected	
Farmer 3	Not Detected	50	Not Detected	Not Detected	50	150	Not Detected
Farmer 4	Not Detected			100	200		
Farmer 5	Not Detected		Not Detected	50	50		
Farmer 6	Not Detected	Not Detected	Not Detected	50	200	Not Detected	Not Detected
Farmer 7	Not Detected	50	50	50	50	Not Detected	
Farmer 8	Not Detected		100	50	Not Detected		
Farmer 9	Not Detected	50	150	Not Detected	Not Detected		Not Detected
Farmer 10	Not Detected	50	50	50	Not Detected	Not Detected	
Farmer 11	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	
Farmer 12	Not Detected		50	Not Detected	Not Detected		
Farmer 13	Not Detected	Not Detected	Not Detected	50	100	Not Detected	Not Detected
Farmer 14			150	Not Detected	50		

The first “go to” wormer for our young stock should be a yellow unless there is a specific reason that your vet has warranted. Alternate the next visit with a white and so on. Part of the objectives of the group is to not use clear wormers on these animals.

Example of different types of wormers:

Types	Benzimidazoles (White drenches)	Levamisole (Yellow)	Macrocyclic Lactones ML (Clear)
Examples	Albex	Levacide	Animec, Bimectin, Eprinex
Administration	Oral dose	Oral dose, Injection or Pour-on	Pour-on, Injections
Dose frequency	Every 3 weeks	Every 3 weeks	3-6 weeks (check data sheets)
Efficacy			
Adult gut worms	X	X	X
Larval gut worms	X		X
Inhibited gut larvae	X		X
Lungworms Adults & Larvae	X	X	X

- Implemented a grazing management plan to reduce the worm burden for young stock using a traffic light system. This strategy is aimed at the most susceptible animals on our farm i.e., calves. Making a map of the grazing area is the easiest way to plot which paddocks may have the highest burden of worms. Open “Google Maps” or “Map It” and select satellite imagery to zoom in on your farm. This will give you a good outline of the shape of your paddocks to draw on your whiteboard. You might need to make a few attempts with the dry markers to get the right shape, but when you are happy with it, use a permanent marker to set the paddocks on your board. If you can remember specific seasonal parasites that you encountered last year (eg coccidia or lungworm), mark these on your paddock. Shading paddocks:

Green- low risk

Orange- medium risk/fouling

Red- High risk or high levels of pasture fouling

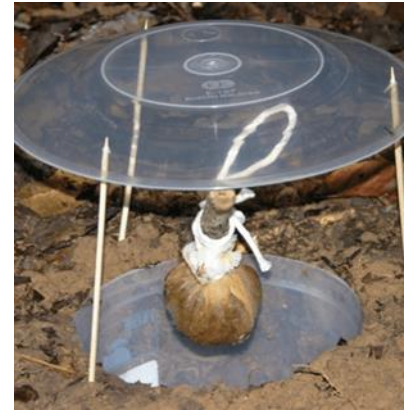
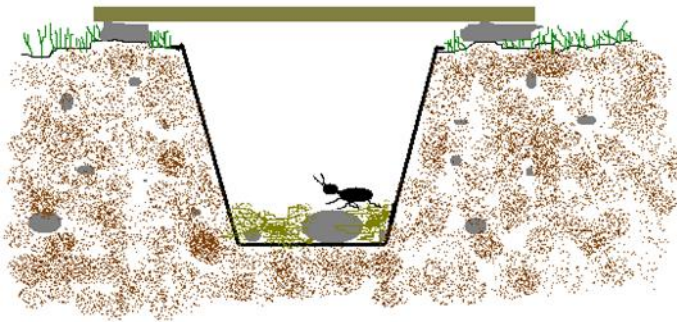
Should the calves get a higher FEC than 250, we then mark these paddocks as “red” as the calves have deposited a lot of eggs out on to pasture and these calves will now need to be wormed. As the season continues and calves reach the 6 month mark, then we can start to move these calves on to orange paddocks to expose them to stomach worms, but we then mark them as “red” as they leave as we are adding to the pasture fouling.

- The group only dosed calves when necessary so when coughing or if the FEC tests required it. The group avoided using long acting mectin “clear” products as they have been shown to be more harmful to insect populations.
- Three training days occurred where the group discussed on the first day we had guest speaker Catherine Keena discussing the importance of biodiversity and ways in which it can be improved on farm and we also discussed best practice with regards to grazing management of young stock. On the second day Orla Keane discussed the different type of wormer products available and benefits and disadvantages of each, the level of resistance to wormers etc. On the final training day we had John Gilmore from Farm labs discussing how to interpret the FEC results and best practice with regards to taking FEC samples.

[More detailed reporting to address](#)

Baseline data

Five farms, with five baited pitfall traps per farm were selected for the baseline survey. The pitfall traps were baited and collected after 10 days. This was repeated 4 times in Autumn 2022, Winter 2022-23, Spring 2023 and Summer 2023. The Samples were collected by farmers & posted to MTU Kerry. They were Cleaned and stored. Identification took place in the lab with microscope and keys



Results

A total of 21,605 individuals were captured, across 45 taxa. Of which 8,275 were beetles. The rest were spiders, flies, isopods, ants, mites, slugs & snails, earwigs, collembola and bugs (Hemiptera)

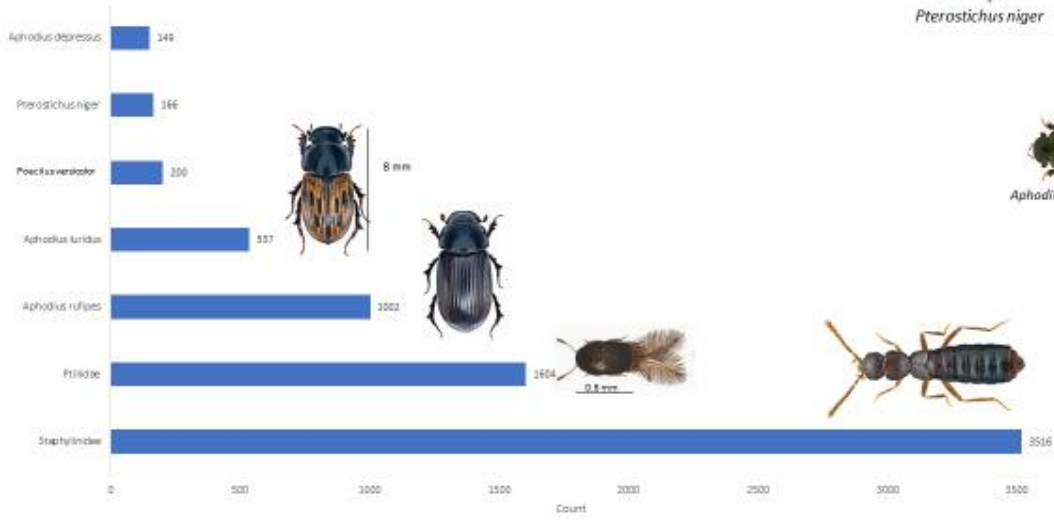
Beetle (Coleoptera) taxa recorded

Taxa	Order	Family	Common name
<i>Lagria hirta</i>	Coleoptera	Tenebrionidae	Darkling beetle
<i>Aphodius rufipes</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius depressus</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius foetens</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius levitulus</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius luridus</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius pedellus</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Aphodius zenkeri</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Teuchestes fossor</i>	Coleoptera	Scarabaeidae	Dung beetle
<i>Geotrupes mutator</i>	Coleoptera	Geotrupidae	Dung beetle
<i>Geotrupes sp.</i>	Coleoptera	Geotrupidae	Dung beetle
<i>Geotrupes spiniger</i>	Coleoptera	Geotrupidae	Dung beetle
Ptiliidae	Coleoptera	Ptiliidae	Featherwing beetle
Endomychidae	Coleoptera	Endomychidae	Fungus beetle
<i>Agonum gracile</i>	Coleoptera	Carabidae	Ground beetle
<i>Amara aenea</i>	Coleoptera	Carabidae	Ground beetle
<i>Anchomenus dorsalis</i>	Coleoptera	Carabidae	Ground beetle
<i>Bembidion lampros</i>	Coleoptera	Carabidae	Ground beetle
<i>Cartonotus aulicus</i>	Coleoptera	Carabidae	Ground beetle
<i>Harpalus rufipes</i>	Coleoptera	Carabidae	Ground beetle
<i>Loricera pilicornis</i>	Coleoptera	Carabidae	Ground beetle
<i>Nebria brevicollis</i>	Coleoptera	Carabidae	Ground beetle
<i>Poecilus versicolor</i>	Coleoptera	Carabidae	Ground beetle
<i>Pterostichus diligens</i>	Coleoptera	Carabidae	Ground beetle
<i>Pterostichus niger</i>	Coleoptera	Carabidae	Ground beetle
<i>Pterostichus sp.</i>	Coleoptera	Carabidae	Ground beetle
<i>Pterostichus strenuus</i>	Coleoptera	Carabidae	Ground beetle
Byrrhidae	Coleoptera	Byrrhidae	Pill beetle
Leiodidae	Coleoptera	Leiodidae	Round fungus beetle
Staphylinidae	Coleoptera	Staphylinidae	Rove beetle
Curculionoidea	Coleoptera	Curculionoidea	Weevil



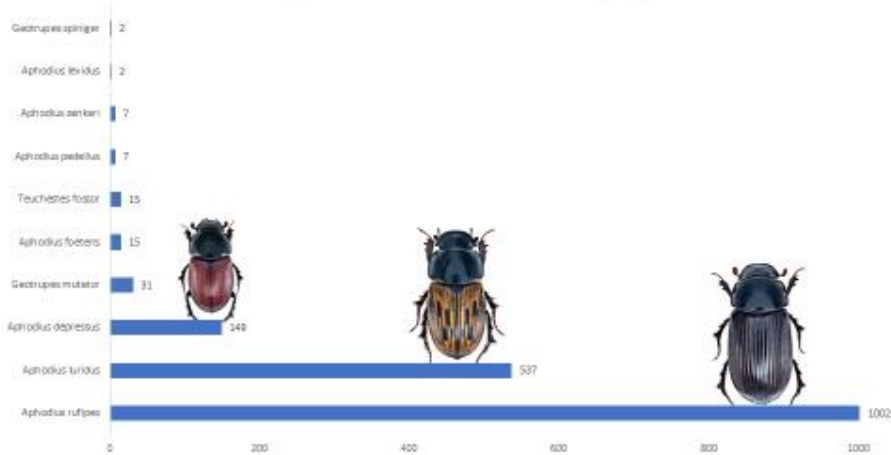
Results

Beetle taxa with abundance > 100 individuals



Results

Dung beetle abundance by species

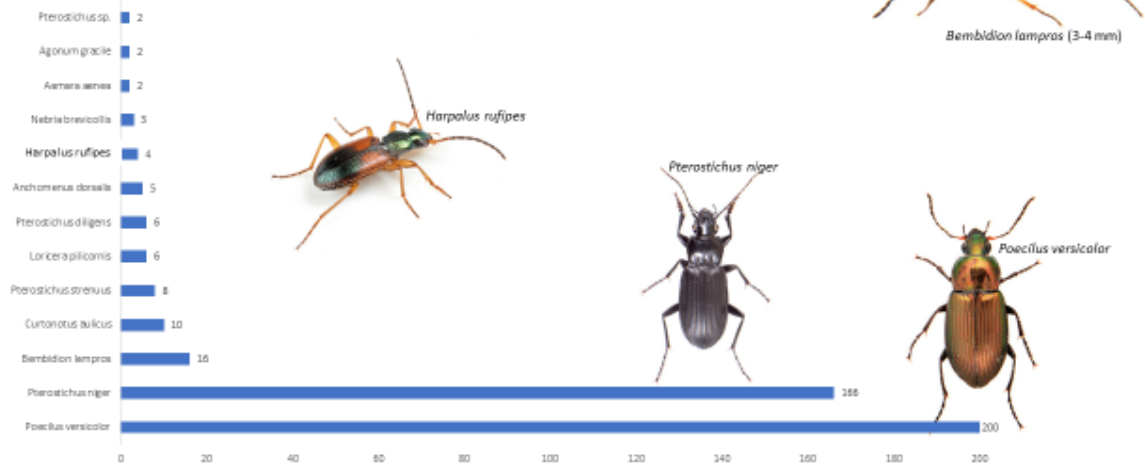


Geotrupes mutator



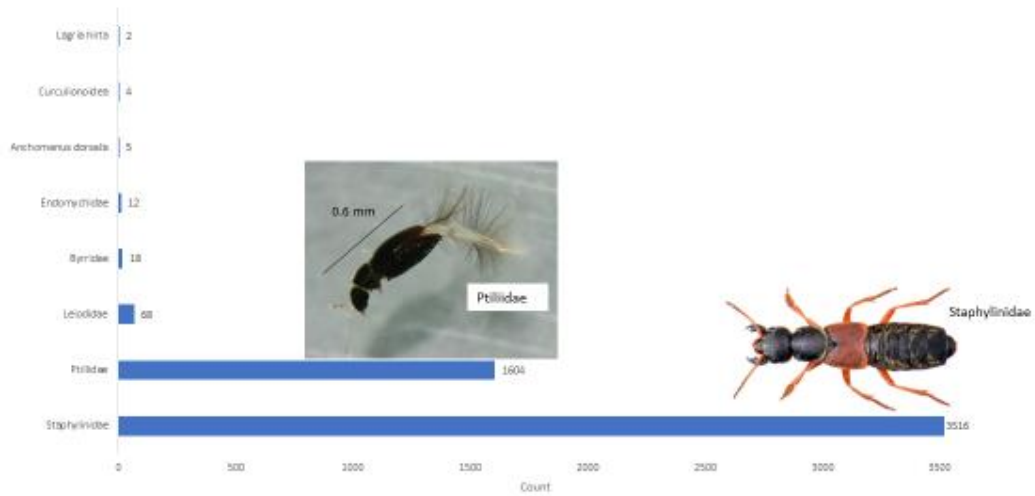
Results

Carabid abundance by species

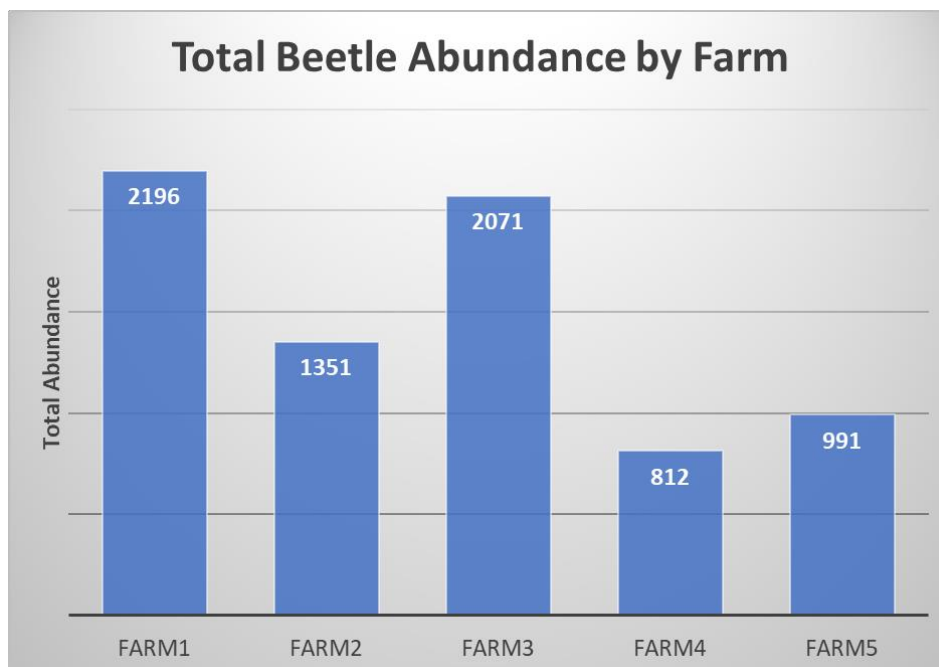
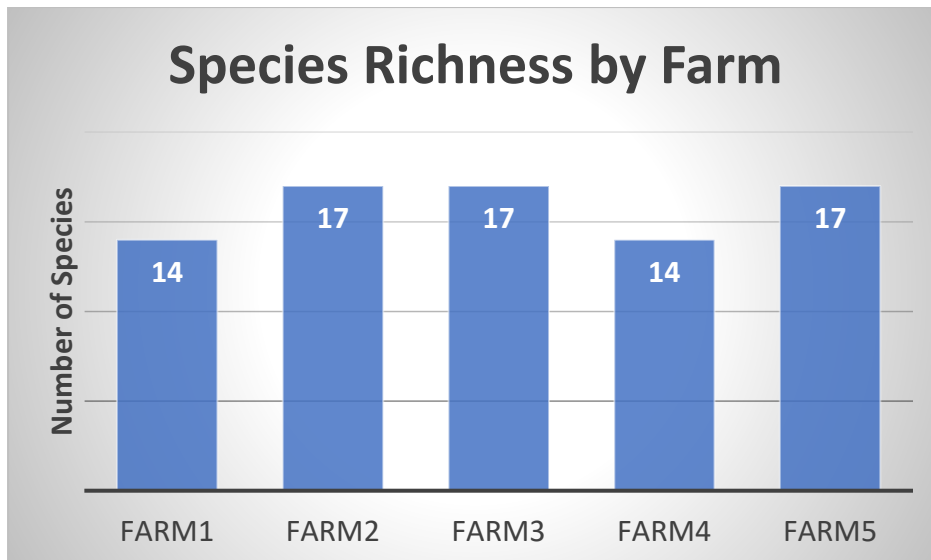


Results

Other beetle taxa



The Graphs above show the different species/ Level of abundance & taxa found in our field survey. Below shows the species richness and abundance for each farm surveyed.



KPIs

- Built a framework for how to educate farmers on the importance of biodiversity and its relationship with animal health
- Successfully developed a practical Dosing planner for young stock to improve health and biodiversity outcomes
- Created the first baseline data on insect populations in dung pads on Irish dairy farms

VFM

This project was excellent value for money. Every aspect of the project was costed and having come in below budget on some costing we were able to undertake additional works such as a website on the project and its findings. The administrative budget was kept to a minimum and most importantly, we spent the majority of the budget on practical measures such as farmer payments for works done, dung beetle survey and marketing which meant that other people heard about the fantastic work we have done.

Financial Report

	€	€
Initial Budget		85000
Administration	5014.31	
Participant Payments	14278	
Survey Cost	10130	
Weighing scales	33000	
Promotion	10543.5	
Training days	1875.9	
FEC testing	3990.2	
Accountancy	3230	
Total Cost	82061.91	
Balance		2938.09

Lessons learned

We learned that it is possible for farmers to use less wormers and maintain animal health. We also learned that there is a thriving insect population in dungpads on dairy farms.

Our current parasite model is unsustainable, costs us money and is damaging to the environment

Grassland management is an overlooked tool in parasite management, particularly in youngstock

A combination weighing scales, farm software, veterinary labs and impartial advice are crucial in decision making

Our cows can contribute positively to ecology

We all have dung beetles on our farms; we just need to look after them!

From an administrative point of view, we learned that the reporting and set up requirements are very onerous for a one-year project. Ideally this should have been a 5 year project as the majority of the administration such as setting up bank accounts, companies would have been completed in year one. If the project timeline was longer, we would have liked to track the difference in insect populations over a number of years and if the different management approach had a major effect.

Actions to carry forward

The Group have developed a dosing planner, which could be used as a management tool by all livestock farmers in the country. This dosing planner is available on the website. Having completed a baseline survey on dung beetle populations it is highly desirable that having implemented the recommendations of the dosing planner to monitor the change of beetle populations over a number of years.

Details of dissemination of project findings

The main method of dissemination of project finding has been via the EIP website that was created Omooreinnovation.ie. We also had a web launch networking event where we had representatives from media present. We had an article on the project findings in Agriland, Farmers Journal and Tirlans monthly newsletter. We have been told that we will be featured on the signpost series weekly podcast.