

# BNFFG Pest Monitoring Series

## Monitor Your Own Pests! How to Use Pitfall Traps for Monitoring Ground Dwelling Insects and Spiders

Factsheet #3  
March 2023



Monitoring and identifying insect and spider communities within forage crop fields and adjacent areas is increasingly important as climate change and changing weather patterns have expanded and altered the usual geographic ranges of pest species [1,2] and their natural enemies. If insect and spider species can be identified, previously established IPM methods and recommendations can be used in conjunction with new strategies to enhance crop productivity and ecosystem health.

Local producers and other community members can become involved in ongoing pest monitoring efforts and can complement the work that researchers are doing in the region to expand our knowledge of insect and spider communities in agricultural areas of Bulkley-Nechako and Fraser-Fort George (see Facebook page for more information). Your involvement can help alert the agricultural community to new pests that may expand into our area due to shifting climate patterns. Such work will also provide producers with more information on what insect pests are impacting their fields, and how a pest might affect their crops or other valuable ecosystem services that their land management otherwise provides (e.g. insect enemies of pollinators). See information at the bottom of the fact-sheet to find out how, and with who, to share information about what you find.

There are several different methods for monitoring particular pest species within a given area. Researchers and volunteers have used sweep nets, baited traps, and general observation in work elsewhere. But one other useful tool that can be used is a pitfall trap.



Beetles collected during pest monitoring in Prince George, summer 2022



Pest monitoring in Telkwa, summer 2022

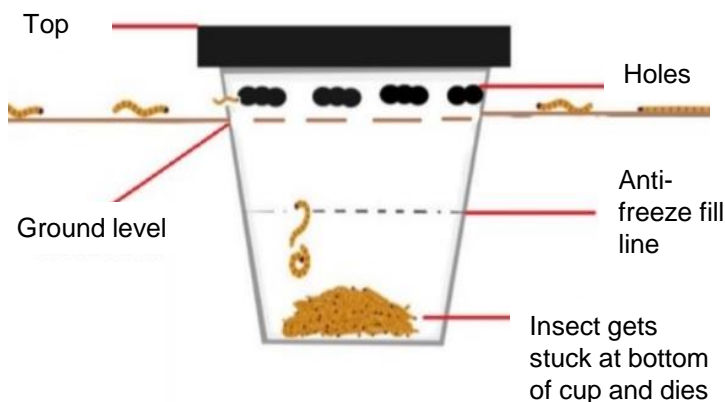
# What is a pitfall trap?



## What is a pitfall trap?

Pitfall traps are containers that are partially buried in the ground and that have an exposed entrance at ground level to capture ground-dwelling insect and spider species. There are many designs for pitfall traps, but they generally have a cup which is partially filled with a liquid to quickly kill the insects. Ideally, they also have a cover to exclude small vertebrate animals such as mammals and amphibians from falling in.

## Pitfall Trap



Wolf spider found in pitfall trap, summer 2022.

## What pitfall traps are used for

Pitfall traps are used as an IPM survey tool to monitor for pest species and natural enemies in a variety of circumstances. They are a safe and easy way to monitor for species of concern which make their living on the ground, like adult click beetles. While they do catch natural enemies, they do not have a major impact on local populations, but rather give an indication of natural enemy community health.



Lined click beetle. Mardon Erbland 2006 (CC BY-NC-SA 2.5 CA)

## When to consider using pitfall traps

Pitfall traps are a great tool for producers to easily sample an area over a season, particularly if they are initially unsure of which species they are looking for. Producers can monitor ground dwelling insect species of interest, ground beetles (which can be effective predators), click beetles (also known as wireworms), certain spiders, ants.





# Using a pitfall trap



## 1. Placement

Consider placement of traps. It is recommended to place traps a minimum of 25 meters apart to ensure good coverage of an area.

## 2. Targets

If you are targeting specific species or a particular group, consider the optimal time of year that the traps should be placed to likely capture those species. Install traps a week before the peak timing of that insect, as traps are sometimes initially disturbed by wildlife, but disturbances generally taper off through the season as animals learn that the cups contain no food.

## 3. Materials

Gather and prepare all required materials (plastic container with holes and a lid, trowel, RV non-toxic antifreeze mix or dish detergent, flagging or other method of marking trap location) ahead of the planned trapping period.



Example of potential pitfall trap but other small containers can be used



Installing a pitfall trap in the ground, summer 2022

## 4. Install

Dig a hole approximately  $\frac{3}{4}$  the depth of the cup and place it, half-filled with solution, in the ground so that punched holes are level with the surface. It is important that the holes are level with the ground so that insects and spiders can crawl in easily.

## 5. Mark

Mark the location where installed

## 6. Check Traps

Return and check on the traps at least weekly (or as often as desired)

## 7. Samples

Record/remove samples for later identification. You can use a small sieve to collect the sample from the solution and store in a small hard container (like a little bottle)

# Trap Samples



## What to do with samples that require identification

If samples are taken from pitfall traps that are of interest to you it is important to document the sample. Producers should record information on when (sampling date range) and where it was found. You can store any insects or spiders you are looking to identify in a freezer in either a small plastic container or in a plastic freezer bag for safe storage. To avoid damage to the sample, put rubbing alcohol in the container with the sample and only use freezer bags if they can be stored safely. Keeping the sample frozen and whole will allow for easier identification, and possibly allow for DNA analysis by a lab.

Use a camera to take photos of individual insects or spiders and try to identify them yourself with assistance from the free iNaturalist app which is available for iPhone and Android. Photos of sampled specimens can be uploaded through the app or web browser which can assist with identification (see other resources listed below).

Reach out to regional entomologists or researchers for help with identification or engage in social media to assist with identification (see links below)



Example of a potential collection container, but other containers or securely sealed bags can also be used if handled carefully.



Collect

Document

Store

Identify

If you collect samples during the 2023 production season and would like to share them with researchers for the Bulkley-Nechako and Fraser-Fort George pest monitoring project, please contact Meganne Harrison (UNBC) at [pests@bcforagecouncil.com](mailto:pests@bcforagecouncil.com)

# Trap Samples



## Responsible Use

- Make sure traps are small to avoid unwanted bycatch of non-targeted species, like amphibians etc.
- Trapping fluid is used because insects need to be killed in the trap as other predatory insects or spiders would eat the rest of the catch. If you would like to catch and release, consider using another active method like a sweep net or digging soil pits.
- Pitfall traps are only useful for capturing ground-dwelling insects and spiders. Other groups of insects, like leafhoppers or grasshoppers, along with other spiders, can be caught using different methods.
- Sweep nets and other methods capture a different group of insects and spiders and can be used to supplement the data collected in pitfall trapping programs.
- Be aware of where traps are set up as they can be small and hard to find in fields and forests when crops or undergrowth have grown in. Use flagging tape or other means to mark trap locations to ensure you remove them from the field before haying or other harvest activities.
- **Don't panic** if you trap a large diversity of insects, doesn't automatically mean there is an infestation that needs to be sprayed/mitigated. Most species of insects are not harmful to crops and play a key ecological role in the health of the agroecosystem and surrounding areas.

## Links:

Facebook Page for insect monitoring in central interior project : <https://www.facebook.com/profile.php?id=100090075117545>

Inaturalist BC is a good resource for identifying unknown insects and spiders and connects you to other naturalists and citizens that will verify identification if possible  
<https://www.inaturalist.org/>

Field Heroes, a comprehensive resource with more information on beneficial insects and pest management from the prairies <https://fieldheroes.ca/>

Government of British Columbia Directory for Regional Entomologists  
<https://dir.gov.bc.ca/gtlds.cgi?searchString=Entomologist&search=Search&for=people&attribute=title&view=&matchMethod=iss&searchString=&sortOrder=ascending&sortBy=name>

## References

1. Smith AL, Hewitt N, Klenk N, Bazely DR, Yan N, Wood S, et al. Effects of climate change on the distribution of invasive alien species in Canada: a knowledge synthesis of range change projections in a warming world. *Environ Rev.* 2012 Mar;20(1):1–16.
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### Research partners

This factsheet was produced by Meganne Harrison (a graduate student at the University of Northern British Columbia) as part of a two-year project (2022/2023) that is collaborating with farmers and ranchers to monitor and identify pests of concern for the agriculture sector across the Bulkley-Nechako and Fraser-Fort George regions.

Meganne's research is being overseen by Dr. Dezene Huber (University of Northern British Columbia) and Dr. Jasmine Janes (Victoria Island University) with support from Serena Black (BC Forage Council) and a dedicated Project Oversight Committee.

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