

**2015 ACORN Conference & Trade Show  
Delta Prince Edward Hotel, Charlottetown, PE**

**Workshop Title: Encouraging On-Farm Biodiversity**

**Speaker & their title:** Paul Manning, University of Oxford

**Executive Summary:**

Paul's presentation focused on how biodiversity can benefit organic farms and how organic farms benefit biodiversity. Paul referenced existing research on this subject, as well as his own research on dung beetles.

**Detailed Notes**

Farmland species of wildlife are in decline everywhere in the industrialized world. Research has established a strong correlation between intensity of farming activity and decline in bird populations. Good data also exists on the relationship between the decline of rare plant species and intensity of farm activity. Soil seed banks are also declining for the same reasons. Extinctions of species worldwide have gone up with the spread of industrial agriculture.

Organic production can play an important role in restoring and maintaining farmland diversity. Meta-analysis (a review of multiple research efforts) shows organic farming systems support 30% more species than conventional farms. Plant species respond most strongly. Unfortunately data is sparse in Atlantic Canada on this topic.

How can we promote on-farm biodiversity?

- Hedgerows - Hedgerows are great for bird populations especially in areas where little diversity exists in the broader environment. An increase in bat populations has also been noted in agricultural ecosystems where hedgerows are present. Bats and birds are often friendly predators on insect populations that damage crops. Bats in particular can have a huge impact on insects. Research has also demonstrated that hedgerows enhance macro-moth diversity.
- Use of non-crop habitat - It has been demonstrated that per acre yield will increase when a portion of arable land is kept out of production. Leaving some cropland fallow provides habitat for beneficial insects and animals. Best results seem to happen if between 5% and 10% of land is not cultivated.
- Maintaining original habitat in row crop systems - Planting original native species in rows between crops that require significant spacing (such as grapes) provides habitat for native insect species.

Does more biodiversity support greater delivery of ecosystem services?

Paul noted that biodiverse ecosystem functioning is very complicated. In general though, it appears that the greater the diversity the greater the benefits and the healthier the ecosystem. To demonstrate his point he used the analogy of a box of assorted chocolates. The larger the population wanting to eat the chocolate the greater the chance less popular chocolates will be eaten and the entire resource used.

Greater predator diversity suppresses a broader range of herbivore populations. It is recognized though that the greatest benefits are usually provided by the most common species.

Paul focused discussion on the subject of his current research: the role of the dung beetle in providing multiple ecosystem services on a farm. Dung decomposition occurs quickly with the

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help of beetles. Dung beetles provide many ecosystem services: suppression of fecal fouling, improvement of soil permeability, and much more. He provided details on the role played by various types of beetles in this process. However beetles are highly susceptible to stressors including drug and chemical residues present in dung and the general environment. The benefits of dung beetle activity are often lost on the conventional farm where the presence of chemicals is more widespread.

Paul noted that one study in Paris found that people are in favour of supporting the encouragement of greater biodiversity despite their inability to sometimes notice when this has happened.

What does all this mean for organic farming:

- It is important to champion the benefits of organic farming and its effect on biodiversity.
- People do care about biodiversity; the general population is supportive.
- Organic production does support biodiversity.
- There are many things one can do to support biodiversity. Experiment in your environment to determine what works for you.
- Much more research is needed.

Q. How can we increase beetle populations on our farms?

A. Beetles love organic material, so spread organic material and keep it moist.