Growing with Beneficial Insects



Soil School Gwendolyn Ellen 4.4.2015





Ag biodiversity can

Mitigate the effects of pesticide drift

Stabilize soil erosion

Decrease dust, weed seed migration, compete with invasive spp.

* Increase water quality

Increase organic matter in soil which fosters microbial diversity and reduce contamination risks (buffers between fields reduced risks in Cornell; Strawn et al 2013)

***** Increase crop pollination

 Provide food and shelter for beneficial insects which can aid in pest management and decrease pesticide use

What is an insectary planting?

Shelter from pesticide and soil disturbance, places to hunt, reproduce and to spend the winter. Some need replacement of dwindling nesting sites; native bees, barn owls.

Diverse sources of food. Rule of thumbs: make blossom happen all season long; plan for chaos; fit within production plan.

Many insect adults need a high energy food source to lay eggs and rear colonies (hover flies, lady beetles parasitic wasps and native bees). This comes in the form of pollen and nectar.

IMPORTANT: Different beneficial organisms need different types of food. Insects and organisms need different types of food at different stages in their lives.

Farm practices that include insectary plantings: flowering cover crops, non-harvested strips, letting crops go to flower

Photo by P

Skinkas



Enhancing already existing habitat: field edges, farm roads, fence rows and riparian areas







In-field insectary plantings









Plan for Chaos



Beetle Banks

In-field, raised beds of native bunch grasses that provide non-disturbed, over-wintering habitat, from which generalist predators disperse in the spring.





Insectaries and beetle banks



Bank, seeded 2009 with native and other grasses (Idaho fescue, sheep's fescue, sand dropseed, orchard grass, needle and thread and basin wild rye) Insectaries include flax, poppy, alfalfa, buckwheat.

Fitting Practices in Farm Production Plan



Perennial or annual planting

Length of time for site establishment

Labor involved in establishment & maintenance

Costs for space, and supplies/funding

Can it be harvested as crop





Is the timing right for resources provided, organisms desired, ability to do

How does the value of the practice compare to other practices?

Does it increase over time?

What beneficial insects are you familiar with?







Insects are different at life stages: becoming more familiar with predators, parasitoids and pollinators will help you provide what they need to be on farm and aid in pest suppression CBC not always a quick fix Not a linear equation

More like checks and balances



Who are we finding?



In beetle banks: important predators: carabid beetles, spiders, earwigs and rove beetles

Predators: True bugs: prey and shelter



big-eyed bug (2-3mm)

All stages of spider mites, flea beetles, thrips, leafhoppers, aphids, corn earworm,

Occur on foliage



DBA flower bugs



predacious stink bugs

prey on small insects, eggs, caterpillars and beetle larvae

Are mass reared



damsel bugs

imported cabbageworm, army worm, lygus bugs & others

uses toxin to subdue prey



assassin bugs

ambush prey, attack small flying insects



both benefit from pollen and nectar sources **Parasitoids**

AND

prey

Predators



tachinid flies

Hosts: moth and butterfly larvae (i.e. cabbage loopers), beetle larvae (i.e. June and elm leaf)

Pollinators



Parasitic Wasps



Need pollen and nectar sources as adults, prey to reproduce





Making mummies



Mummies = good monitoring tool

Important in managing aphids in Christmas Trees

PNW Christmas Tree Pests



Benes occur in Assemblages

Native Pollinators: Bees

Roughly 4000 species in N. America and 600 + species in OR

Three groups of native bees:





Tunnel nesters (about 30%)



Bumble bees, social cavity nesters (above or below ground



www.ipmnet.org

gwendolyn@science.oregonstate.edu