

Integrating Conservation Biological Control on Farms: Banking on Beetles in Oregon

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www.beetlebank.org

Background

✳ In 2005, several vegetable farmers attending Farmscaping for Beneficial (FSB) events expressed an interest in constructing beetle banks as a conservation biological control method on their farms.

✳ Beetle Banks are undisturbed, grassy mounds constructed in the field that provide essential over-wintering habitat for predatory beetles and spiders that act as generalist feeders among crops throughout the growing season. The beetles and spiders have the potential to limit numbers of many kinds of crop pests.

✳ In 2006, four participating Oregon organic farmers and FSB researchers were awarded this SARE grant to look at on-farm populations of predacious ground beetles and to begin developing on-farm technologies for beetle banks. Project farmers and researchers have collaboratively developed science-based, farming-system tested, practices for beetle bank design and establishment appropriate for the western United States. We have also identified specific native plant species and plant associations that provide effective beetle habitat and that minimize weed establishment. The banks are a focus for evaluation, learning and feedback among farmers using various participatory, community integrated pest management (IPM) approaches.

✳ In 2006, we set our targets on development of bank construction techniques, bank establishment and sharing techniques through farm walks and meetings. In 2007, we worked on fine tuning bank establishment, maintenance and weed management in addition to fulfilling our objectives of understanding the characteristics of the selected native grasses and the occurrence and diversity of predacious ground beetles on the farms.

✳ The program consists of:

- Farmer-to-farmer information exchanges
- Farm walks and demonstrations of techniques
- On-farm research and development
- Emphasis on integrating conservation practices into farm plan

Outreach/Actions



Four farm walks, two farmer dinners, two farmer panels, farmer and poster presentations at 5 regional conferences, one watershed meeting, and five Bugscaping Games (an interactive habitat planning session) have exposed hundreds of Pacific Northwest growers to diverse farming systems, a variety of functional agricultural biodiversity techniques used by farmers, including the construction of beetle banks in Oregon and what we are learning about the predacious ground beetles associated with them. The images above show a farm walk at Gathering Together Farm, Philomath, Oregon, "bugscaping" Fry Family Farm in Central Point, Oregon with farmer cooperator Vince Aloniz, and a beetle bank tour at a farmer dinner at Persephone Farm, Lebanon, Oregon.

Farmer Collaborators and Beetle Banks

Since 2005, six beetle banks have been created on cooperating farms, two failed and two new ones are planned for 2008. The successful establishment of the banks requires implementation methods that fit within the farm production plan, knowledge of cultivating native grasses, farm weed and pest cycles and the ecology and biology of the predacious ground beetles.



Mulched hand-raised beetle bank at 47th Ave Farm
Portland, Oregon



Above, one of three banks at Persephone Farm
fall broadcast seeded with *Alopecurus geniculatus* in Lebanon, Oregon



Plowing to raise the beetle bank
(right) and mulching the bank (far
right) during a farm walk at Whistling
Duck Farm, Grants Pass, Oregon



Transplanting the beetle bank (top left) at
Gathering Together Farm, Philomath,
Oregon. The same bank with established
Elymus glaucus the following spring (above)

Benefits

Grass trial
banks at
the end of
the
rainbow
on OSU's
Hyslop
Research
Farm



Organisms found in 2006-8 beetle banks
include 139 different arthropod species;
including 26 species of carabids, 15 species
of Rove beetle and 25 species of spiders



Flamed 6 week-old bank to
manage weeds

Outcomes of Banking on Beetles in Oregon include:

✳ Developing successful beetle banks in organic systems and successful weed management techniques such as flaming, mulching and site preparation, bank raising techniques, and choosing appropriate native grass species.

✳ Collecting preliminary data on predacious ground beetles populations on Oregon farms and the habitat and other beneficial organisms associated with them.

✳ Increasing the adoption of beetle banks in the PNW. This project has inspired a total of 17 known experimental beetle banks to be raised to date, in addition to the four that farmers established under this project. Eleven of the banks, as are at OSU research stations, four others in Oregon and two are in eastern Washington. Other banks are planned at New College of Florida and the Universidade Estadual Paulista in Sao Paulo, Brazil.

✳ Developing collaborations with Oregon's Natural Resource Conservation Service, Oregon Metro, The Xerces Society for Invertebrate Conservation, Oregon Tilth and the Northwest Farmer to Farmer Network

