

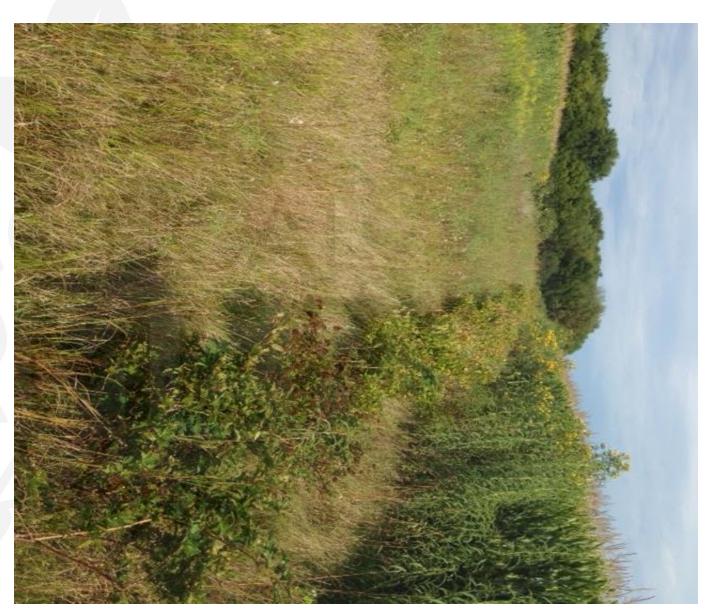
Paul Mugge 6190 470th St. Sutherland, la 51058 712-446-2414 pmugge@midlands.net

Farming since 1976 Organic since 2001 300 acres



CRP Strip – established in 2002

- Pollen barrier
- Living snow fence
- Trees and shrubs
- 15 year contract
- Renewed in 2016
- Ecological trap?



CRP Project

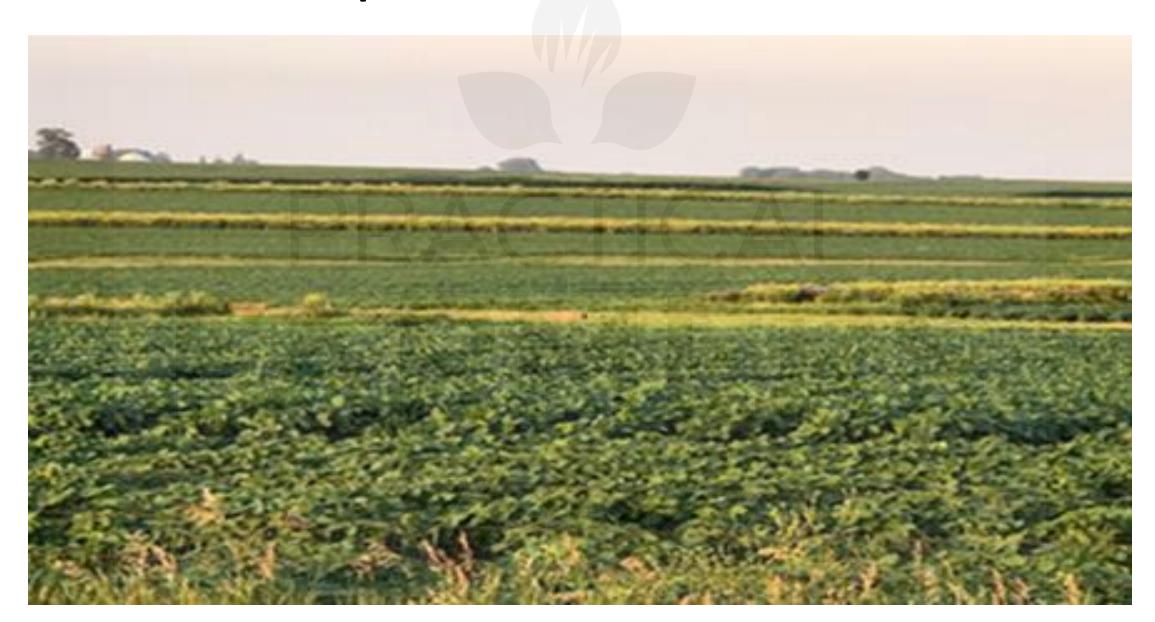
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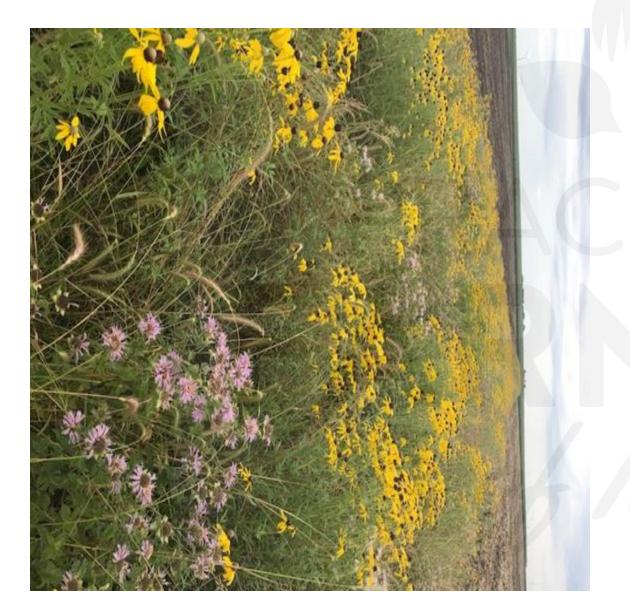


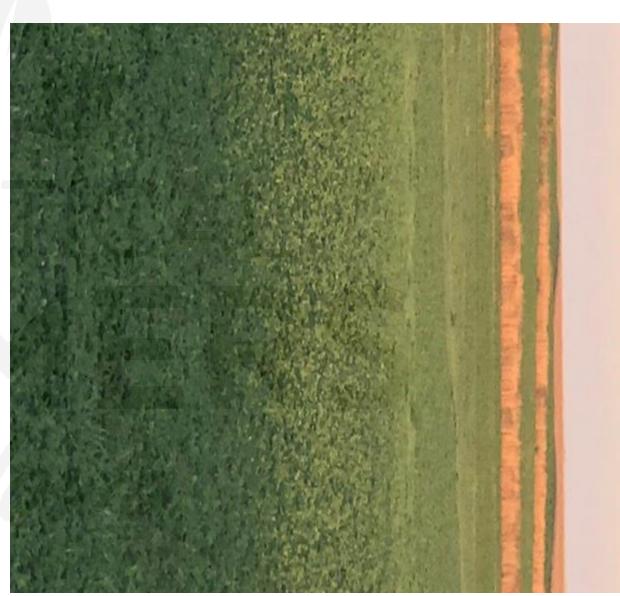
CSP Strip – established in 2015





Latest Strip – Established 2018



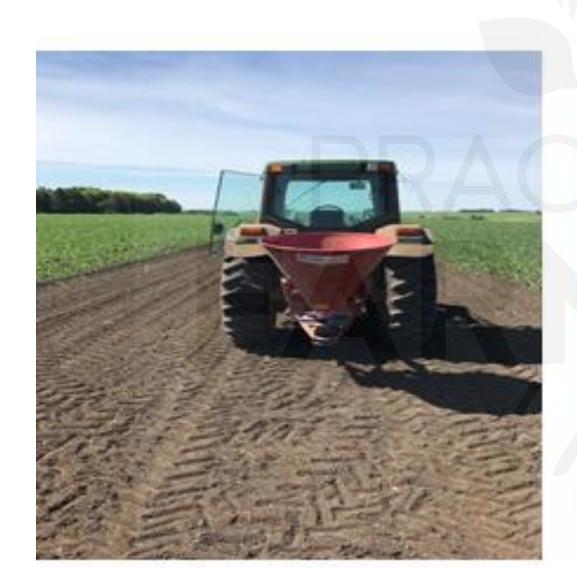






- Protect pollinators
- Largest invertebrate conservation society in the world
- Insects
 - world needs insects
 - many species threatened
 - base of food systems
 - clean rivers
 - improve soil health

Seeding the Newest Strip

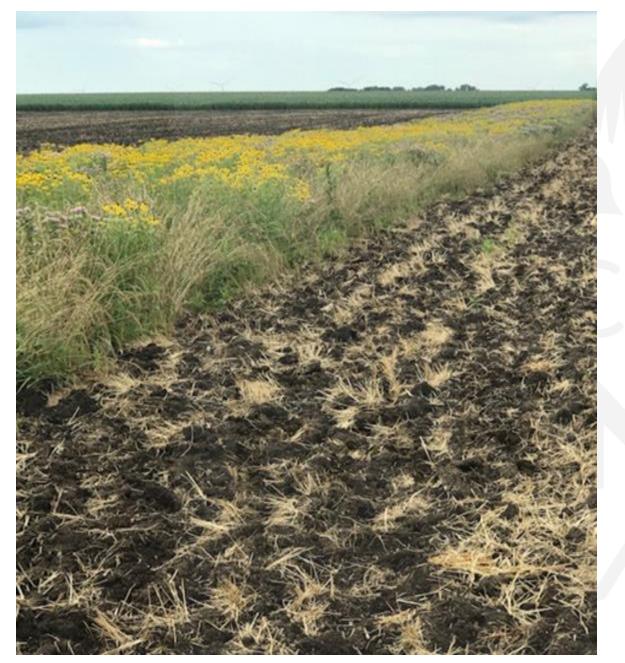




Latest Strip late season

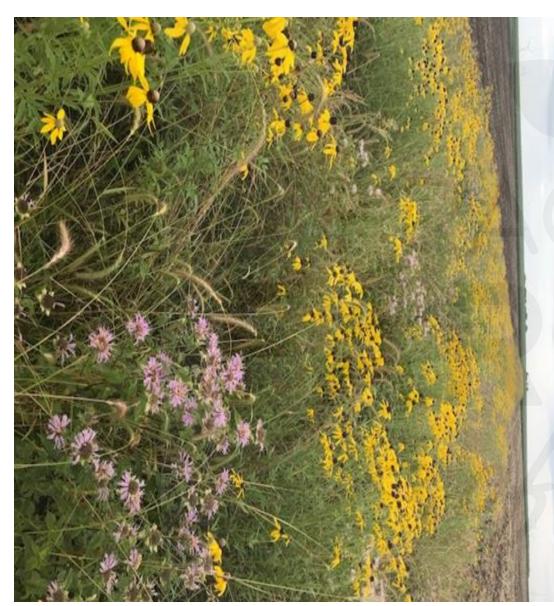








Many Benefits



- 2.6 fold) insect taxa richness
- 3.5 fold) pollinator abundance
- 2.1 fold) bird species richness
- 2.1 fold > abundance of bird species of greatest conservation need
- greater bee species richness and abundance

Research Highlight: Prairie strips support farmer's soil, water, and wildlife conservation goals, 2018

Biodiversity



- Higher infield diversity = > arthropod abundance
- Both pollinators & predators
- But not herbivores

A synthesis of the effects of diversified systems...., Lichtenberg, Global Change Biology, 2017

Beneficial Insects

photos Xerces Society

Syrphid fly

Pennsylvania leatherwing





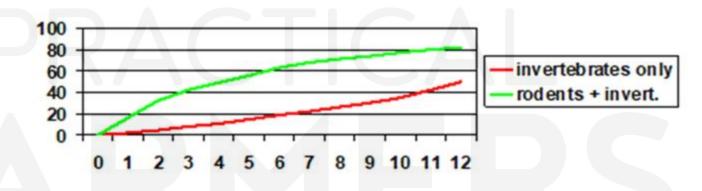


Seed Predation

- Leave seed on soil surface
- Habitat on field borders, etc.
- Small fields (diversity helps)
- Need cover & overwinter habitat



Predation of Giant Ragweed Seeds



Cumulative seed predation (%) vs.

Time after seed dispersal (months)



Wildlife Habitat



- Significantly higher density of birds
- Dickcissel, eastern meadowlarks, and grasshopper sparrow
- red-winged blackbirds fledge
 2.1 times more often

A synthesis of the effects of diversified systems...., Lichtenberg, Global Change Biology, 2017



Neonicatinoids

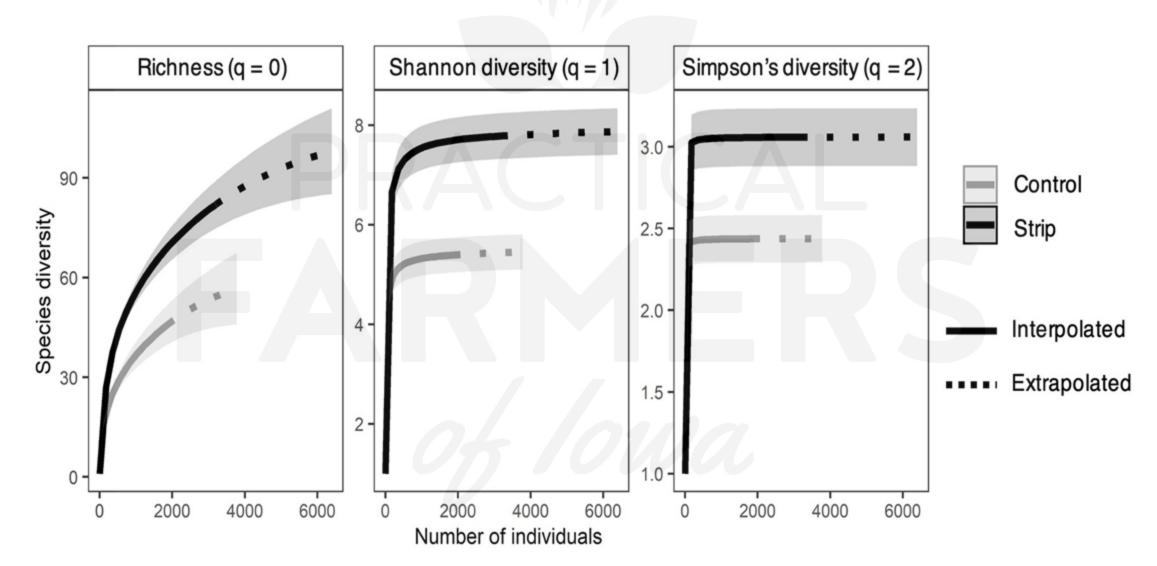


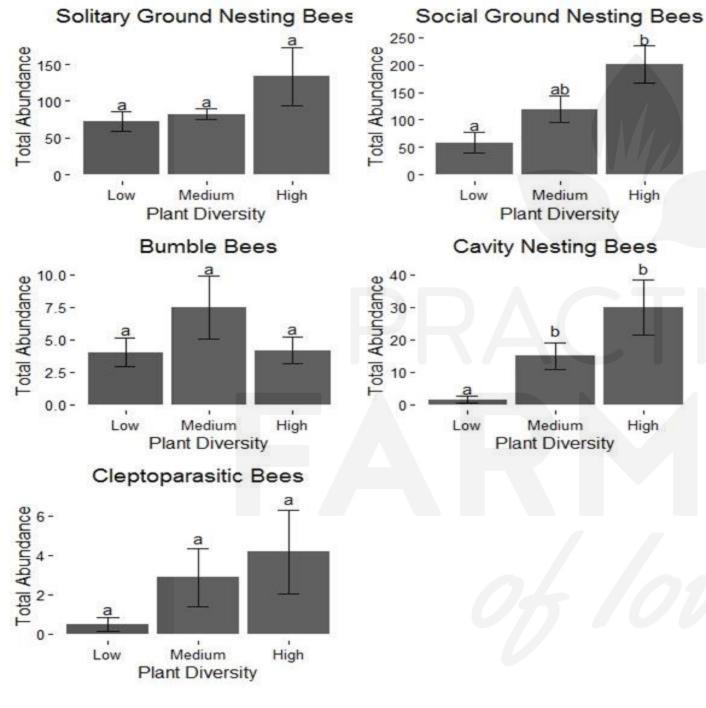
from Nat'l Climate Assessment ISU Prairie STRIPS photo Farnaz Kordbacheh



Strips of prairie vegetation placed within row crops can sustain native bee communities

2020, Farnaz Kordbacheh 1*, Matt Liebman1, Mary Harris2, 2019





 Total bee abundance in each plant diversity level for each guild of bees (solitary ground nesting bees, social ground nesting bees, bumble bees, cavity nesting bees and cleptoparasitic bees) across 2014 and 2015 in contour buffer and filter strips with standard error bars.

- Amy Lynn Moorhouse
- Iowa State University, 2016

Prairie Strips

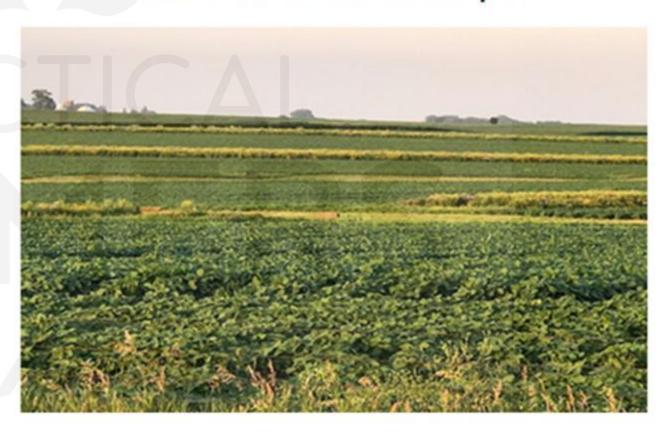
Org. = incr. beneficial insect diversity,

"A global synthesis of the effects of diversified farming systems...", Global Change Biology 23(11): 4946-57

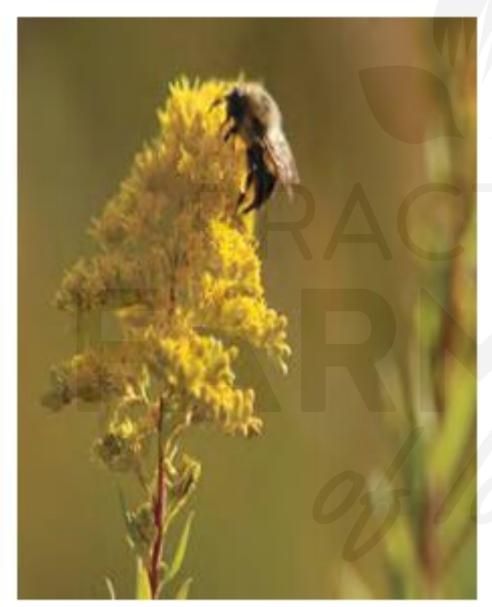
 Org. support 50% more pollinators

"Comprehensive Assessment of Soil Health", The Cornell Framework Manual

Narrow Prairie Strips



Pollinator Habitat





Point estimates for the multiplicative relationship of the treatment (10–20% prairie) versus the control (0% prairie)

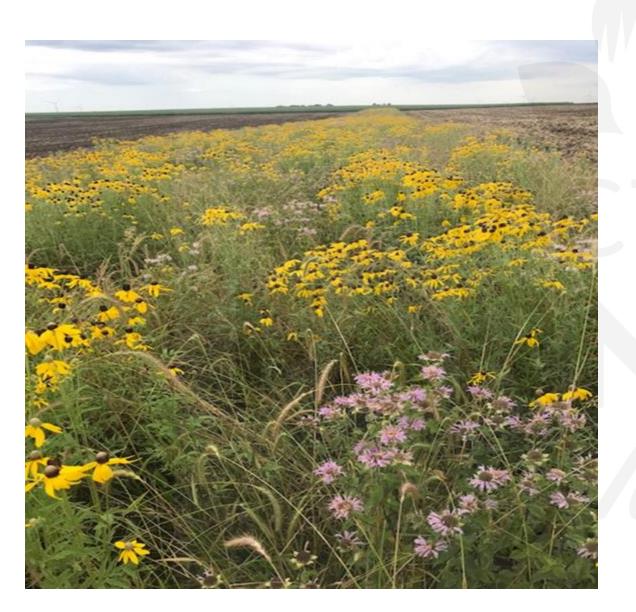
Prairie strips improve biodiversity and the delivery of multiple ecosystem services from corn—soybean croplands, Lisa Schulte, 2017

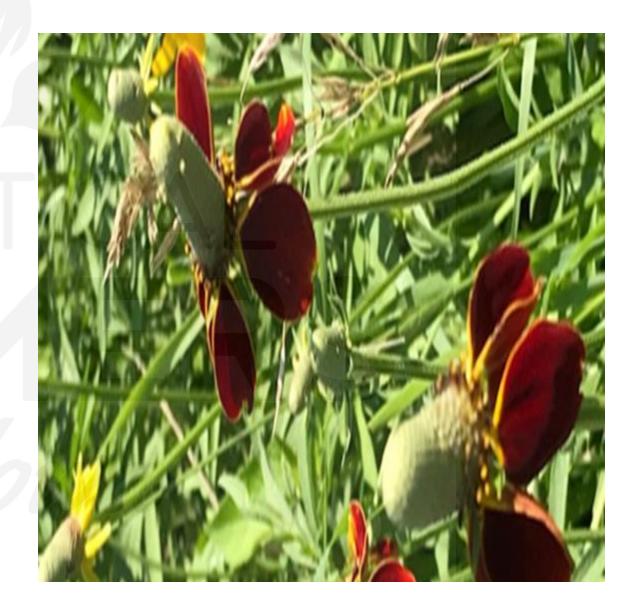
	abundance	diversity	species richness
insects	1.55	1.14	2.61
natural enemy insects	1.46	1.06	2.2
pollinator insects	3.47	1.89	2.44
birds	2.63	1.94	2.08
birds SGCN	2.06	1.71	1.75
grassland birds	1.13	1.11	1.11

Benefits in addition to the physical ones

- Prairie strips improve biodiversity and the delivery of multiple ecosystem services from corn soybean croplands
- Lisa A. Schulte, et al 2017

Aesthetics





Challenges

- Canada thistle
- Marestail
- Brome encroachment
- Alternate hosts?
- Pest habitat?
- Insecticide/herbicide



PFI Field Day



