

PLANT MATERIALS TODAY

A newsletter from the USDA-NRCS Montana-Wyoming Plant Materials Program for those interested in Plants and Conservation



Volume 18 Number 5

December 2012



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🌿 Feature Topic 🌿

DESIGNING A POLLINATOR-FRIENDLY PLANTING. Demonstrating plant selection and seeding rates.

Seed production fields at the Bridger PMC (BPMC) have long provided excellent habitat for native and non-native pollinating insects. Throughout the growing season there are acres of plants in various stages of flowering, attracting and protecting insects from far and wide. Currently, there is widespread concern over declining pollinator populations and increasing emphasis within NRCS to enhance their habitat.



Figure 1. Foundation seed fields of Antelope white prairie clover, Stillwater upright prairie coneflower, and Goshen prairie sandreed (front to back).

These conservation issues prompted the BPMC to install two new demonstration areas of pollinator-friendly plants. The plantings showcase two native grasses and 12 native wildflowers and their role in pollinator conservation. Field observations on establishment and management may yield new information on ways to enhance pollinator habitat.

The gardens are composed of single species plots, mixture plots, and alternate-rows of grass and forb mixtures. Because some forbs and grasses require a cold period to break seed dormancy, one planting was seeded in the spring and another in late fall. As most field office folks know, challenges with recommending native forbs in any kind of conservation planting include limited commercial availability and affordability, poor competitiveness with grasses, and a high risk of seedling failure. As a result, a majority of the seed used in the plantings are released germplasms from NRCS Plant Materials Centers in Idaho, Montana, and North Dakota.

For the spring planting, species were chosen based on seed availability, a lack of seed dormancy, season of bloom, and in the case of the grass, a short to medium height and low to moderate competitive nature. Selection criteria

was the same in the fall planting, except some species required a seed dormancy breaking period over winter. We also adhered to a composition ratio of 75% forb and 25% grass as set forth in the USDA NRCS Technical Note No. 78 (see reference).



Figure 2. Direct seeding the pollinator planting at the BPMC on May 9, 2012.

The spring-seeded species are, from early to late season flowering, Great Northern Germplasm western yarrow *Achillea millefolium* var. *occidentalis* (ACMIO), Maple Grove Germplasm prairie flax *Linum lewisii* (LILE3), Meriwether Germplasm blanketflower *Gaillardia aristata* (GAAR), Stillwater Germplasm upright prairie coneflower *Ratibida columnifera* (RACO3), blackeyed Susan *Rudbeckia hirta* (RUHI Laramie County, WY), Antelope Germplasm white prairie clover *Dalea candida* (DACA7), and High Plains Germplasm Sandberg bluegrass *Poa secunda* (POSE). Seeding rates in the spring planting were mostly based on recommendations outlined in NRCS Plant Materials Technical Note MT-46 (see reference) with pure-live-seed per square foot and percentage composition as shown in Table 1.

Plot establishment was good and largely attributed to supplemental irrigation and periodic weed control.

Table 1. Seeding rate and percentage mixture composition in the spring planting.

Species	All Species Mix		Alternate Row Mix	
	Sd/ft	%	Sd/ft	%
ACMIO	4	12.5	5	16.7
DACA7	4	12.5	5	16.7
GAAR	4	12.5	5	16.7
LILE3	4	12.5	5	16.7
RACO3	4	12.5	5	16.7
RUHI	4	12.5	5	16.7
POSE	8	25	20	NA
Total	32	100	Forbs 30	100

An evaluation on September 18 of single-species plots indicated Antelope white prairie clover and Maple Grove prairie flax had the greatest solid stand establishment, flower numbers, insect visitation, first year suitability, and soil stability.



Figure 3. Using a mechanical cultivator to control weeds four months after planting.

Meriwether blanketflower had good stand establishment but produced only two to three flower stalks at the end of the growing season. Great Northern western yarrow had poor stand establishment. High Plains Sandberg bluegrass establishment was poor to fair in all of the plots. All species in the forb mixtures

established well, including Great Northern western yarrow, and produced abundant flowers, attracted numerous insects, and provided soil stability.



Figure 4. Floral display in the two forb mixtures on September 19, 2012.

For the fall planting, species selection and seeding rates were based on preliminary results of the spring seeding, establishment in an older initial wildflower evaluation planting, and findings from a nearby conservation demonstration garden.

We chose (listed in order by bloom season) Old Works Germplasm fuzzytongue *Penstemon eriantherus* (PEER), silverleaf phacelia *Phacelia hastata* (PHHA Deer Lodge County, MT), Bismarck Germplasm narrow-leaved coneflower *Echinacea angustifolia* (ECAN), Rocky Mountain beeplant *Cleome serrulata* (CLSE King County, UT), Medicine Creek Germplasm Maximilian sunflower *Helianthus maximiliani* (HEMA) dotted gayfeather *Liatris punctata* (LIPU Fergus County, MT), and ‘Rimrock’ Indian ricegrass *Achnatherum hymenoides* (ACHY). Solid stand seeding rates were calculated as described in the spring planting, but the two mixture rates varied depending on species composition in the mix as shown in Table 2.

Table 2. Seeding rate and percentage mixture composition in the fall planting.

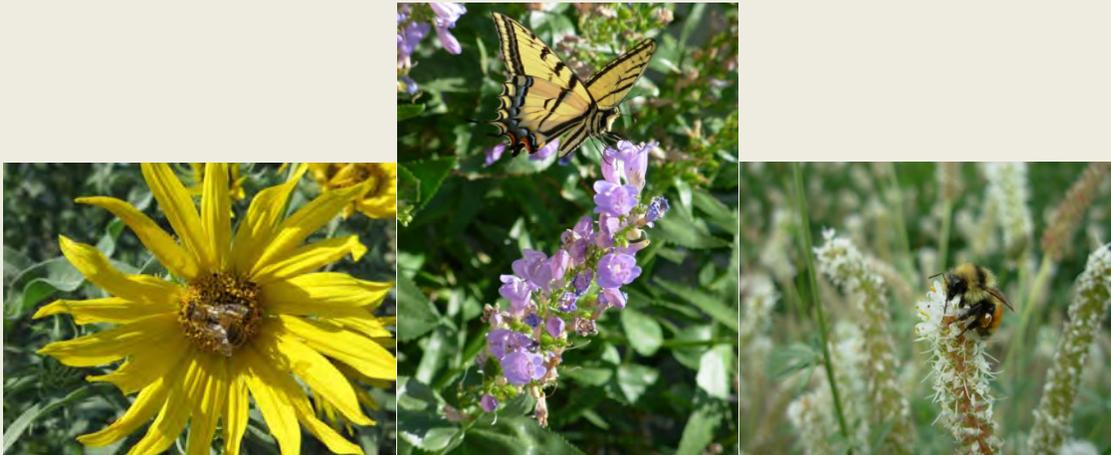
Species	All Species Mix		Alternate Row Mix	
	Sd/ft	%	Sd/ft	%
ACHY	6	20	20	NA
PEER	5	16.7	6	20
CLSE	4	13.3	5	20
ECAN	4	13.3	5	16.7
LIPU	4	13.3	6	16.7
PHHA	4	13.3	5	16.7
HEMA	3	10	3	10
Total	30	100	Forbs 30	100



Figure 5. Examples of height differences in Maximilian sunflower and other forbs in the BPMC’s conservation forb garden.

In 2013, standard plant evaluations will be conducted and attempts made to identify a majority of the visiting insects in both the spring and fall plantings. Subjects of future study include larger-sized plantings, broadcast seeding, seed coat treatments, dryland conditions, minimal weed control, as well as a variety of different mixtures.

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Figures 6 through 8. Bees and butterfly visiting wildflowers.

USDA NRCS Technical Note No. 78: Using Farm Bill Programs for Pollinator Conservation.

http://plants.usda.gov/pollinators/Using_Farm_Bill_Programs_for_Pollinator_Conseration.pdf

NRCS Plant Materials Technical Note MT-46: Seeding Rates and Recommended Cultivars.

<http://www.mt.nrcs.usda.gov/technical/ecs/plants/technotes/pmtechnoteMT46.html>

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