PLANTING #78 6 Acres
GOBBLER RIDGE @ CLEAR CREEK KNOLLS
2007 PLANTING HISTORY - **UPDATED for 2009**
Prepared by Bernie Buchholz 11/17/09

1. Good prescribed fire March 17, 2209; may have burned more thoroughly than Jay's planting to the north due to the winter mowing of the ag weeds which consolidated the fuel.
2. Weed swept at least 4-5 times.
3. Spent inordinate time (say 40 hours) trying to manage all clovers; had huge and valuable impact but did not eliminate the low spreading clovers and I will probably minimize this effort in future. One sweet clover bloomed and dropped some seed in NE area of planting.
4. Due in part to ample rainfall, the second year growth was notably advanced and highly diverse. Stunningly attractive forb growth.
5. Substantial amount of several less desirable natives: hairy aster (Ast vil), Canada goldenrod (Sol can) and stiff goldenrod (Sol rid). Cut approximately three barrels of Canada and stiff gldenrod; applied herbicide to about 35% of the stems.
6. 2-3 of 6-7 hazelnut plugs survived first season; protect from 2010 prescribed burn.
7. Appears that south border and SW corner are dry-mesic to mesic.
8. See Seed List for 2009 overseeding.

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2007 PLANTING HISTORY - **UPDATED for 2008**
Prepared by Bernie Buchholz 3/8/09

1. Germination rates seemed very high, especially encouraging was an apparently high level of lead plant (Amo can). Distribution of seedlings was relatively even and substantial.

2. Swept for seeds about 5 times; growth of ag annuals complicated this task later in the season; the grasses waterway will require another Poast+ treatment to reduce brome.

3. To facilitate weed sweeping, Cindy mowed the planting in January '09 during a heavy cover of snow and hard freeze.

4. Overseeding was limited because germination rates are not yet clear.

PLANTING #75 6 Acres
2007 PLANTING HISTORY
GOBBLER RIDGE @ CLEAR CREEK KNOLLS
Prepared by Bernie Buchholz 1/18/08

SITE CONDITIONS:

Location:

Ogle County - Taylor Township 22N - Range 9 - Section 10E; the south east quadrant of Lowden and Flagg roads, immediately northeast of Fame Flower Knob

Soil Types:

According to the Ogle County Soil Study, soils include:

#73 Ross loam -- 7 inches of black loam over 25 inches of dark grayish brown loam;

#570C2 Martinsville – 4 inches of dark gray silt loam over a 34 inch subsoil composed of three levels: (1^{st}) silt loam/silt clay loam, (2^{nd}) clay loam, and (3^{rd}) friable sandy loam;

#727B Waukee loam – 10 inches of black loam over subsurface layer of 5 inches of brown loam over 26 inches of subsoil composed of three levels: (1^{st}) yellowish brown layer of friable loam, (2^{nd}) dark brown loam, (3^{rd})yellowish brown loam.

My on site observations while preparing the site for planting are that the soils appear to be a well drained and that the top 4-5 inches are a rather uniformly medium brown sandy loam mix. There is no visible gravel and the few scattered surface rocks are generally 5-6 inches in diameter.

See Ogle County Soil Study in Nachusa HQ for soils map.

Topographic Features:

The site slopes very gently from north to south, falling perhaps 2 meters over 210 meters; a grassed waterway, partially protected by a 5 foot swath of brome, cuts diagonally across the site from north northwest to south central, flattening and disappearing 40 meters from the south boundary. The two track on the east edge will be planted in 2008. Two tracks along the south and west boundaries of the 2007 planting will provide equipment access.

Agricultural History:

The 1939 aerial photos indicate the field to be in row crops; recent years have seen the site in corn, including 2007, which produced the best corn yields in memory due to exceptionally well-timed rains.

SPECIES SELECTION AND STRATEGY:

The two main components of "new field" plant selection are (1) forbs and grasses and (2) trees and shrubs.

Forbs and Grasses:

The overriding principle for selection of forbs and **non-dominant** grasses was to plant the greatest diversity of species considered suitable for the site's well-drained sandy/loam soil. The species list was further expanded in light of the widely held idea that when in doubt, include marginal species (habitat wise) and then allow Nature to determine whether or not the species will prosper at the site.

Contributing criteria that support and inform the "suitable species" concept include hydrology, remnant species adjacent to the site, plant associates per Swink and Wilhelm, soil types that suggest species, species identified on similar sand hill prairies in the area and the actual availability of seed.

Regarding **dominant** grasses, dominant **tall** grasses were omitted because big blue stem (And. ger.) and Indian grass (Sor. nut.) were seen as less appropriate for sand hill prairies. We also seek to establish substantial forb and non-dominant grass populations before dominant grasses could overwhelm the planting. Little blue stem (And. sco.) was planted at modest rates of less than five pounds per acre for the same reason.

Planting the correct proportion of species is subject to experience and experimentation. My ratios are substantially based on mentoring from Jay Stacy, although my 2006 planting has begun to provide personal experience. For example, both artemisia caudata and monarda punctata germinated more abundantly than expected. Also, the Stacy maxim of planting more asters than goldenrod by weight has been an important standard. It is relatively easy to collect and then over plant goldenrod due to their abundance.

Trees and Shrubs:

Selection of trees is essentially determined by whether or not the site is believed to have been savanna in the pre-settlement era. Remnant black oak (Que. vel.) and burr oak (Que. mac.) on the west edge of Clear Creek led to planting substantial numbers of acorns in both the 2006 and 2007 plantings. Some people envision this as a pre-savanna planting, anticipating that grub oaks will grow into trees at some point over the next few decades. White oak acorns (Que. alb.) are included (primarily in Planting #68), in addition to black and burr, because white oak probably disappeared due their considerable desirability for lumber and their susceptibility to disruption from agriculture. In 2008, red oak (Que. rue.) will be added now that a source is identified. Shagbark hickory (Car. ova.), wild plum (Pru. Ame.) and hazelnut (Cor. max.) are included.

SITE PREPARATION:

Weather conditions Oct 28 through Nov 16 were dry and above average temperature, consistent (sometimes strong) westerly winds created a lot of dust.

Oct 28: Don Rogers combined his corn crop

Oct 30: Cindy Buchholz mowed the corn stubble with the batwing pulled by JD 4010 - 4 hrs; Bernie “Rounded Up” the 5’ wide brome waterway; ran short of herbicide on last (south end) 20 feet - 1.5 hrs

Nov 1: Excellent growing season produced above average amount of corn plant mass; burn conditions were favorable & the corn burned quickly & thoroughly; simultaneous attempts to burn the 2006 planting (Planting # 68) were unsuccessful, due to insufficient fuel; installed T posts on west and south boundaries at 25 meter intervals beginning in the southwest corner

Nov 7: Cindy harrowed field (JD 540) in preparation for planting – N to S and E to W - 5 hrs; that evening we inventoried bagged seed against list prior to mixing – 5 hrs

SEED PLANTING:

Weather conditions Oct 28 through Nov 16 were dry and above average temperature; consistent (sometimes strong) westerly winds created a lot of dust.

There were only two planting zones; the general seed mix was used over the entire site; along the waterway, which is hoped will hold moisture longer than the rest of the site, we targeted moisture loving species, such as apocynum cannibinum, corylus Americana and coreopsis tripteris. Small rises that appeared above possible erosion areas received much of the most conservative plant seeds that were available only in small quantities.

Nov 8: Bernie mixed seed in Morton bldg, while Cindy finished hand milling seed – 4 hrs each; after lunch, Cindy pulled pendulum spreader and foamer with Kubota: N to S and E to W; started at seed setting #18; used settings up to #24, but primarily #20-#22; foamer was critical to even seed distribution - 4 hrs

Nov 9: Cindy applied third pass of seed diagonally; foamer performed poorly, possibly due to overnight freezing temps – 3 hrs; harrowed planted field with one pass – 3 hrs

Dry soils and strong winds made for dirty work; face mask and goggles necessary

Nov 14: Bernie started “hand planting”; used rubber glove on seed hand to prevent seeds from picking up human scent which could lead to predation by critters; porcupine grass was planted one by one on knees in groups of 8-12 seeds – 2 hrs; lupine planted one by one immediately adjacent to in-place corn root balls in the hope that the dead roots might hold moisture, provide aerated soil and prevent seed loss to erosion – 1.5 hrs; remaining 4 hrs on various seeds – total day 8 hrs

Nov 15: Bernie continued hand planting; used various mixtures of low volume seeds; plans to drop pinches (8-20 seeds) and “foot smear” them in were scuttled by consistently high winds; I was unwilling to bend over to ground level hundreds of times; ultimately, many of the targeted hand plant seeds were carefully hand broadcast in areas deemed to be low risk for erosion – total day 6 hrs

Nov 18: Bernie continued hand planting – 4 hrs

Nov 20: Bernie continued hand planting – 8 hrs

Nov 28: Bernie tested the idea that compaction of the soil might increase the rate of seed germination. The idea arose from the apparent success Jay Stacy has experienced by "stepping in" conservative species by foot. If foot compaction increases germination, would use of a lawn roller increase germination for a large number of seeds?

We used the Byron Forest Preserve's lawn roller (approximately 40 inches wide and 250 pounds filled with 80 gallons of water (+/- 10 gallons) @ 8lbs per gallon) for estimated total weight of 1,050 pounds. The Gator easily pulled the roller over this flat site. We compacted two test strips: pt 25 m north to 50 m north and pt 75 m north to pt 100 m north; each strip was 110 meters east to west. Test strips are marked on the site with metal T posts at 25 m intervals. The ground was partially frozen, apparently reducing the amount of compaction. The roller appeared to impact only about 80% of the surface area due to the irregular surface caused by residual furrows from the prior year's row crop. It took several hours to pickup and return with the equipment. Time elapsed pulling the roller was about one hour.

SEED LIST:

The planting includes 161 species; total weight is 288 lbs or 48 pounds per acre. Total weight per acre includes 4.5 lbs of little blue stem and 43.5 lbs of forbs and non-dominant grasses. Tall grasses were intentionally omitted. Seed collection target had been 50 lbs per acre.

Seed list attached; the planting mix mistakenly included 6.0 lbs of koeleria cristata rather than the targeted amount of 2.5 lbs.

MAPS:

For 2007 Planting site see Current & Future Plantings Exhibit attached.

LESSONS LEARNED:

The 2007 planting process went quite smoothly due to good weather and great support from Bill Kleiman and staff. The following lessons are mainly fine-tuning:

Equipment and Miscellaneous:

1. The mechanized portion of the planting was completed in advance of Nov 15th, which is the assumed safe planting date to avoid fall germination. Be aware of weather trends for early plantings.

2. Although not a major problem this year, avoid non-essential operation of heavy equipment on the planting surface which could result in pre-planting soil compaction. Survey the planting surface for areas requiring extra harrowing.

3. Allow 1 hour to prepare tines on harrow which are critical to effective operation; this year setting the harrow more horizontally (i.e., level front to back) eliminated the accumulation of corn stubble on the leading edge of the harrow. This accumulation occurred last year as the front edge was set low to assure that the rear tines were touching soil.

4. The center link (screw) that sets the pendulum spreader height was not tightened securely, requiring continual adjustments to prevent poor foamer operation.

5. Foamer is CRITICAL to complete coverage of seed at uniform levels; prepare and test in advance; do not allow exposure to freezing temps. Use of the GPS system purchased early November may be an alternative for some. However, my experience using the GPS while pulling the New Idea spreader with the Jimmy suggest the system was routinely off target by 2 to 4 feet which is much too large a margin of error for the type new field plantings being undertaken.

Hand Planting:

6. Approximately 20-25 species were set aside for “hand planting” primarily because they were very desirable conservative plants collected in very small volumes. Rather than simply hand broadcasting the subject species, a better approach to effective, broad distribution might be accomplished by using the pendulum spreader (with adequate bulk seed to act as a carrier) over targeted areas such as small knobs followed by harrowing. (This does not include those species that are literally planted one-by-one such as lupinus perennis, callirhoe triangulata, cirsium hillii and asclepias tuberosa.)

Use of the pendulum spreader with special seed mixes targeted to specific locations might be accomplished even more beneficially with subsequent use of a weighted lawn roller as described above to mimic “stepping-in” process.

7. There is a desire to harrow immediately after broadcasting to avoid seed loss through bird predation and wind loss. In a perfect world, post planting harrowing would be after hand distribution of asclepias stricta and gnaphalium obtusifolium and others that would benefit, including the 20-25 species described in #6 above.

8. Question: If it is true that (1) large volumes of some conservative plant seeds (amorpha canescens @ 1 lb per acre, for example) often yield extremely limited numbers of new plants and that (2) "stepping in" conservative seeds (per the Stacy technique) yields verifiable success (i.e., higher germination rates), doesn't it make sense to reduce or eliminate such seed in the general mix and instead rely on stepping in such seed? Such seed could then be collected in smaller volume. This approach would be dependent on manpower and desire. Also, over seeding a prior planting by stepping in conservatives the second year could be accomplished without the threat of losing conservative plant seed to first year planting erosion. Note: if compacting with the lawn roller is effective, the most efficient approach would be to cease stepping in and put all seed in the spreader.)

9. When compacting with a lawn roller, it would probably be advantageous to do so when soils are not frozen. Use of two rollers, instead of the one used in this first test, would eliminate the soil disturbance (waffleing) caused by the gator tires that are wider than the single roller. It would be best to test the lawn roller again regardless of 2007 results, avoiding frozen soil conditions.

SCIENTIFIC NAME	COMMOM NAME	S/W
Agastache scrophulariaefolia	Purple Giant Hyssop	5
Agrimonia gryposepala	Tall (?) Agrimony	2
Agrimonia pubescens	Soft Agrimony	5
Allium canadense	Wild Garlic	2
Allium cernuum	Nodding Wild Onion	7
Amorpha canescens	Leadplant	9
Amorpha fruticosa	Indigo Bush	6
Andropogon gerardii	Big Bluestem; Turkeyfoot	5
Andropogon (Schizachyrium) scoparium	Little Bluestem	5
Anemone canadensis	Meadow Anemone	4
Anemone cylindrica	Thimbleweed	6
Anemone virginiana	Tall Thimbleweed	5
Antennaria neglecta	Field Cat's Foot	4
Antennaria plantaginifolia	Pussy Toes (Everlasting)	3
Apocynum androsaemifolium	Spreading Dogbane	5
Apocynum cannabinum (X medium)	Dogbane (Indian Hemp)	4
Aristida purpurascens	Arrow Feather	5
Artemisia caudata (campestris)	Beach Wormwood	5
Asclepias amplexicaulis	Sand Milkweed	7
Asclepias tuberosa interior	Butterfly Weed	7
Asclepias verticillata	Whorled Milkweed	1

		10
Asclepias viridiflora	Short Green Milkweed	[15]
Aster azureus (oolentangiensis)	Sky-blue Aster	8
Aster ericoides (prostratus)	Heath Aster	5
Aster laevis	Smooth (Blue)(Silky) Aster	9
Aster linariifolius	Stiff Aster (Flax-Leaved)	10
Aster novae-angliae	New England Aster	4
		10
Aster oblongifolius	Aromatic Aster	[15]
		10
Aster ptarmicoides	White Aster (Stiff Aster)	[15]
		10
Aster sericeus	Silky Aster	[15]
		10
Astragalus canadensis	Canadian Milk Vetch	[15]
Baptisia leucantha	White Wild Indigo	8
		10
Baptisia leucophaea	Cream Wild Indigo	[15]
Bouteloua curtipendula	Side-Oats Grama	8
Bouteloua hirsuta	Hairy Grama	8
Cacalia atriplicifolia	Pale Indian Plantain	8
		10
Cacalia plantaginea (tuberosa)	Indian Plantain	[15]
		10
Cacalia suaveolens	Sweet-scented Indian Plantain	[15]
		10
Callirhoe triangulata	Clustered Poppy Mallow	[15]
Carex bicknellii	Copper-shouldered oval Sedge	10
Carex muhlenbergii (enervis)	Sand Bracted Sedge (Muhlenberg's)	5
Carex pennsylvanica	Common Oak (Penn) Sedge	5
Carya ovata	Shagbark Hickory	5
		10
Castilleja sessiliflora **	Downy Yellow Painted Cup	(20)
Ceanothus americanus	New Jersey Tea	6
Chrysopsis camporum (Heterotheca)	Golden Prairie Aster	5
		10
Cirsium hillii *** (pumilum)	Hill's Thistle	(20)
Comandra umbellata (richardsiana)	False Toadflax	7
Coreopsis lanceolata	Sand Coreopsis	5
Coreopsis palmata	Prairie Coreopsis	6
Coreopsis tripteris	Tall Coreopsis	5
Corylus americana	American Hazelnut	5
Cyperus filiculmis	Slender Sand Sedge	5
Danthonia spictata	Poverty Oat Grass	3
Desmodium canadense	Showy Tick Trefoil	4
Desmodium illinoense	Ill. Tick Trefoil	6
Dodecatheon meadia	Shooting Star	6
Echinacea pallida	Pale Purple Coneflower	8
Elymus canadensis	Prairie Wild Rye	4
Elymus villosus	Silky Wild Rye	5
Eragrostis spectabilis	Purple Love Grass	3
Erigeron strigosus	Daisy Fleabane	5
Eryngium yuccifolium	Rattlesnake Master	9
Eupatorium altissimum	Tall Boneset	0

Eupatorium perfoliatum	Boneset	4
Euphorbia corollata	Flowering Spurge	2
Festuca obtusa (subverticillata)	Nodding Fescue	5
Gaura biennis pitcheri (longiflora)	Common Gaura	2
Gentiana (alba) flavida	Cream Gentian	9
Gentiana (Gentianopsis) crinita	Fringed Gentian	10
Gentiana purberulenta	Prairie Gentian	10
		10
Geum triflorum	Prairie Smoke (Long-plumed Purple Avens)	[15]
Gnaphalium obtusifolium	Sweet Everlasting (Old-Field Balsam)	2
Helianthemum bicknellii	Rockrose (Frostweed)	10
Helianthemum canadense	Common Rockrose (Frostweed)	8
Helianthus hirsutus	Hispid sunflower	5
Helianthus occidentalis	Western Sunflower; Naked S.	10
Helianthus rigidus (laetiflorus)	Prairie Sunflower	8
Helianthus tuberosus	Jerusalem Artichoke	3
Heliopsis helianthoides	False Sunflower; " Ox-eye "	5
Heuchera richardsonii grayana	Rough Heuchera; Alum root	8
Hieracium gronovii	Hairy Hawkweed	6
Hieracium longipilum	Long-Bearded Hawkweed	9
Houstonia (Hedyotis) longifolia		10
(canadense) Long	-Leaved Bluets	(20)
Hystrix patula (Elymus hystrix)	Bottlebrush Grass	5
Isanthus (Trichostema) brachiatus (m)	False Pennyroyal	8
Juncus greenei	Greene's Rush	8
Juncus interior	Inland Rush	6
Juncus tenuis	Path Rush	0
Koeleria cristata (macrantha)	Prairie June Grass	7
Krigia virginica	Dwarf Dandelion	6
Kuhnia (Brickellia) eupatoroides		
corymbulosa	False Boneset	4
Lechea stricta	Bushy Pinweed	10
Lechea tenuifolia	Slender-Leaved Pinweed	8
Lechea villosa (mucronata)	Hairy Pinweed	6
Lespedeza capitata --	Round-headed Bush Clover	4
Liatris aspera	Rough Blazing-star (Rough Gayfeather)	6
Liatris cylindracea	Dwarf Blazingstar	8
Liatris pycnostachya	Tall Gayfeather; Prairie Blazing Star	8
Linaria canadensis	Blue Toadflax	6
Linum sulcatum	Groved Yellow Flax	8
Lithospermum canescens	Hoary Puccoon	6
Lithospermum incisum	Fringed (Narrow-leaved) Puccoon	8
Lobelia inflata	Indian Tobacco	4
Lobelia spicata	Pale-spike Lobelia	6
Lupinus perennis	Wild Lupine	7
Lysimachia lanceolata	Lance-Leaved Loosestrife	7
Lysimachia quadriflora	Narrow-Leaved (Whorled) Loosestrife	9
Monarda fistulosa	Wild Bergamot	4
Monarda punctata villicualis	Horse Mint	5
Napaea dioica	Glade Mallow	10
Oenothera biennis canescens	Common Evening Primrose	0
Oenothera clelandii (rhombipetala)	Sand Evening Primrose	7
Onosmodium hispidissimum	Marbleseed	9
Opuntia humifusa (compressa)	Prickly Pear Cactus	5

		9
Oxalis violacea	Violet Wood-sorrel	[15]
Panicum capillare	Old Witch Grass	1
Panicum leibergii	Prairie Panic Grass	10
Panicum oligosanthes scribneria	Scribner's Panic Grass	4
Panicum perlongum	Long-stalked Panic Grass	10
Panicum villosissimum	White-Haired Panic Grass	8
Panicum virgatum	Prairie Switch Grass	5
Parthenium integrifolium	Wild Quinine (Feverfew)	8
Paspalum ciliatifolium muhlenbergii	Hairy Lens Grass	6
Pendicularis canadensis	Wood Betony	9
Penstemon digitalis	Foxglove Beardtongue	4
Penstemon hirsutus	Hairy Beard tongue	9
Penstemon pallidus	Pale Beard Tongue	6
Petalostemum (Dalea) candidum	White Prairie Clover	9
Petalostemum (Dalea) purpureum	Purple Prairie Clover	9
		10
Phlox maculata	Sweet William Phlox	(20)
Physocarpus opulifolius	Ninebark	8
Polemonium reptans	Jacob's Ladder	5
Polygala incarnata **	Pink Milkwort	10
Polygala polygama obtusata	Purple Milkwort	9
Polygala sanguinea	Field Milkwort	6
		10
Polytaenia nuttallii	Prairie Parsley	[15]
Potentilla arguta	Prairie Cinquefoil	9
Prenanthes aspera	Rough White Lettuce	8
Prunus americana	Wild Plum	5
Pycnanthemum tenuifolium	Narrow-leaved Mountain Mint	7
Quercus alba	White Oak	5
Quercus macrocarpa	Bur Oak	5
Quercus velutina	Black Oak	6
Rosa carolina	Pasture Rose	5
Rudbeckia hirta	Black-eyed Susan	1
Rudbeckia subtomentosa	Sweet Blackeyed Susan	9
Ruellia humilis	Wild Petunia	7
Salix humilis	Prairie Willow	6
Scrophularia lanceolata	Early figwort	5
Scrophularia marilandica	Late Figwort	4
Scutellaria parvula leonardi	Small Skullcap	7
Senecio plattensis	Prairie Ragwort	6
Silene antirrhina	Sleepy Catchfly	1
Silphium integrifolium	Rosinweed	5
Silphium laciniatum	Compass plant	5
Silphium terebinthaceum	Prairie Dock	5
Sisyrinchium albidum	Common Blue-eyed Grass	7
Solidago (Euthamia) graminifolia nuttallii	Grass-leaved Goldenrod	4
Solidago missouriensis fasciculata	Missouri Goldenrod	7
Solidago nemoralis	Gray Goldenrod; Oldfield	4
Solidago rigida	Stiff Goldenrod	4
Solidago speciosa	Showy Goldenrod	7
Sorghastrum nutans	Indian Grass	5
Specularia (Triodanis) perfoliata	Venus' Looking Glass	4
Spiraea alba	Meadowsweet	7

Sporobolus heterolepis	Prairie Dropseed	10
Stipa spartea	Porcupine Grass	7
		10
Talinum rugospermum ***	Sand Fameflower	[15]
Tephrosia virginiana	Goat's Rue	8
Teucrium canadense	American Germander (Wood Sage)	3
Tradescantia ohiensis	Ohio Spiderwort	4
Triosteum aurantiacum	Early Horse Gentian (Orange-fruited)(Feverwort)(Tinker's Weed)	5
Triosteum perfoliatum	Horse Gentian (Feverwort)(Tinker's Weed)	5
Tsuga canadensis	Hemlock	
Verbena stricta	Hoary Vervain	4
Verbena urticifolia	Hairy White Vervain	5
Veronicastrum virginicum	Culver's Root	7
Viburnum prunifolium	Black Haw	5
Viola fimbriatula	Sand Violet	6
Viola pedata lineariloba	Birdsfoot Violet	9
Viola sagittata	Arrow-leaved violet	7
Vulpia octoflora tenella	Six-weeks fescue	4
		10
Wulfenia bullii *** (Besseya)	Kittentails	(20)
Zizia aptera	Heart-leaved Meadow Parsnip	10
Zizia aurea	Golden Alexanders	7