

Kucera Farm

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Switchgrass Biomass Energy Project



Perennial Crops For Biomass

- Consider Switchgrass or other perennial biomass crops on HEL soils
- Ken Vogels/ARS Farm Scale Production Cost of Switchgrass for Biomass



Fig. 1 Location of field sites where switchgrass was managed as a bioenergy crop





2007/07/21





Quail Buffers (CRP)





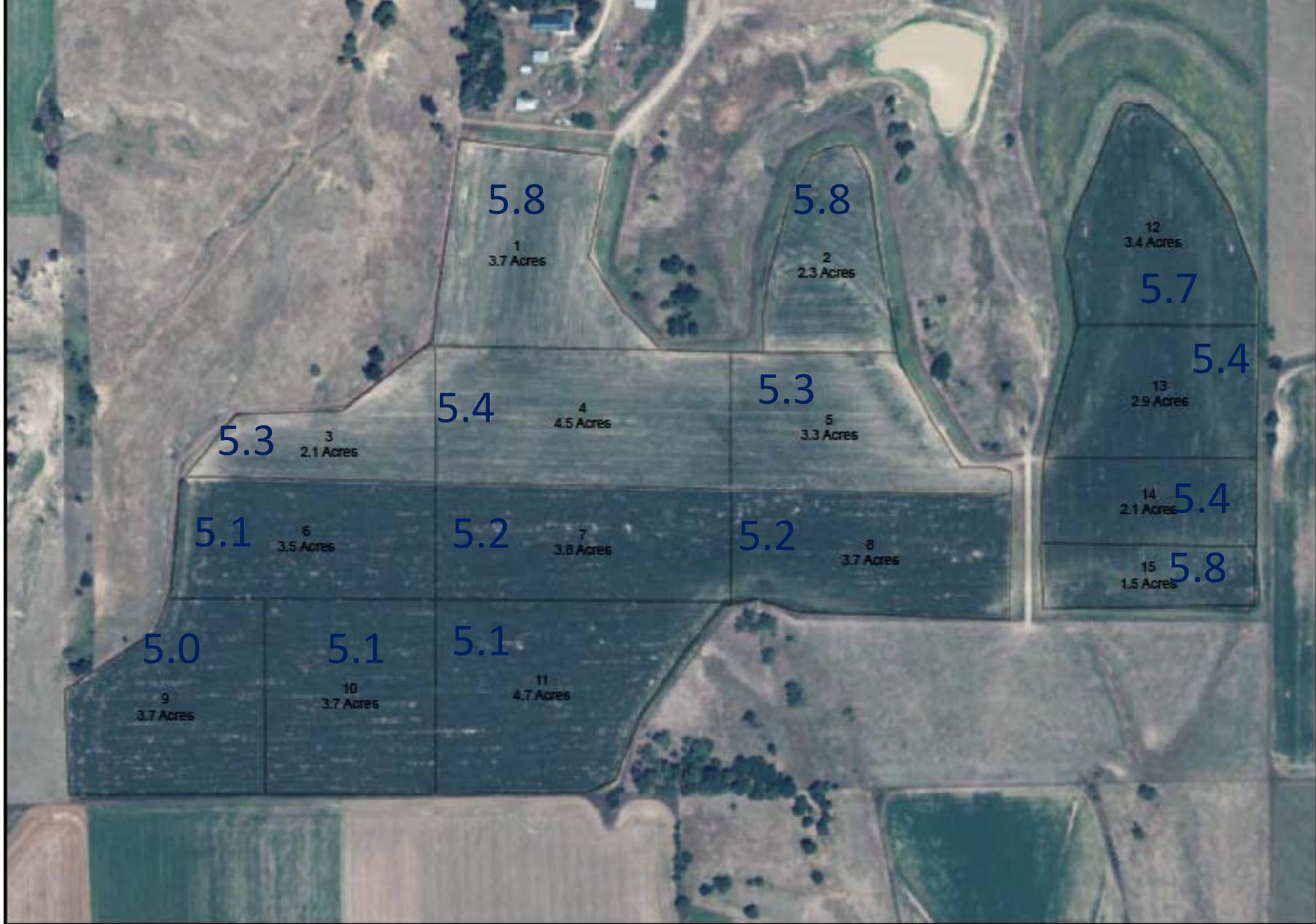
Cont No-
Till Corn
SB-
Wheat
Rotation
60 Bushel
Soybeans



2012 Corn Planted into Wheat (severe drought)

unlock the
SECRETS
IN THE
SOIL







Management Zone	Soil pH	Buffer pH
	5.8	6.5
	5.8	6.6
	5.3	6.3
	5.4	6.4
	5.3	6.3
	5.1	6.3
	5.2	6.3
	5.2	6.3
	5	6.2
	5.1	6.4
	5.1	6.4
	5.7	6.6
	5.4	6.6
	5.4	6.4
	5.8	6.5

Gleaner R52 Crary Air Reel



Poly Skid Shoes





Harvesting Soybeans September 2013





Wheat Drill





unlock the
SECRETS
IN THE
SOIL



unlock the
SECRETS
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SECRETS
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The Nozzles

Part Numbers

TDXL/TDCXL11001
 TDXL/TDCXL110015
 TDXL/TDCXL11002
 TDXL/TDCXL110025
 TDXL/TDCXL11003
 TDXL/TDCXL11004
 TDXL/TDCXL11005
 TDXL/TDCXL11006
 TDXL/TDCXL11008
 TDXL/TDCXL11010



The most proven multi-purpose Venturi air injection nozzle

TurboDrop® XL Medium Pressure Nozzle (TDXL)

Wide Pressure Range:	TDXL 20-120psi TDCXL 30-150psi
Wide Drift Control Range:	Sizes 01-02: 20-60+ psi Sizes 025-04: 20-80+ psi Sizes 05-10: 20-100+ psi
Separate Injector (Venturi)	Comes apart by hand, easy to clean (no tools required).
Patented Stabilization Chamber	Even and uniform mixing of air with liquid which gives a tighter, more uniform droplet spectrum and a homogeneous spray solution across a wide operating range.
Excellent With Rate Controllers	Wide pressure range allows greatest speed variations.
Improved Coverage, Reduced Runoff	Air-filled droplets spread on the target surface rather than bouncing off.
Reduced Clogging	Round metering orifice versus elliptical slit.
Interchangeable Tip / Cap	Two spray nozzles in one. Other tips may also be used.
Proven TurboDrop® Technology	Over 17 Years in 40 countries.
Longer Wear Life	TDXL: 20-30,000 Acres

Description

110° Flat Fan Multi-purpose medium pressure air induction nozzle

20 - 120 psi Overall pressure range
 30 - 90 psi Optimal pressure range

Estimated life (60' boom, 20" centers)
 20,000 - 30,000 acres TDXL
 50,000 - 80,000 acres TDCXL

Polyacetal Venturi body and SprayMax TipCap nozzle with EPDM seat gasket.

TDXL has ceramic metering orifice in



Weed Management System

Roundup
Resistant
Water-
hemp





Wheat Stubble Mgt

- Leave as tall as possible
- Limit residue removal/grazing
- Avoid brassica monocultures for cover crops
- If cover crops are used limit growth and utilize cocktails to avoid (water conservation)
- Terminate green bridge volunteer wheat late in the late fall for wheat streak mosaic (curl mites)



New Herbicide for Resistant Weeds

- Enlist Weed Control system includes seeds that are genetically modified to tolerate the new herbicide from Dow, Enlist Duo.
- Enlist Duo contains 2,4-D that adds another mode of action to the glyphosate-based herbicides.
- Better protection against tougher weeds, which have been growing resistant to the glyphosate.
- Commercial application of the system requires both the new seed traits as well as the new herbicide to be approved by the regulatory authorities
- Corn production in 2014, for soybean production in 2015 and cotton production in 2016.

Legume mixture (N fixation) and carbon mixture (carbon)



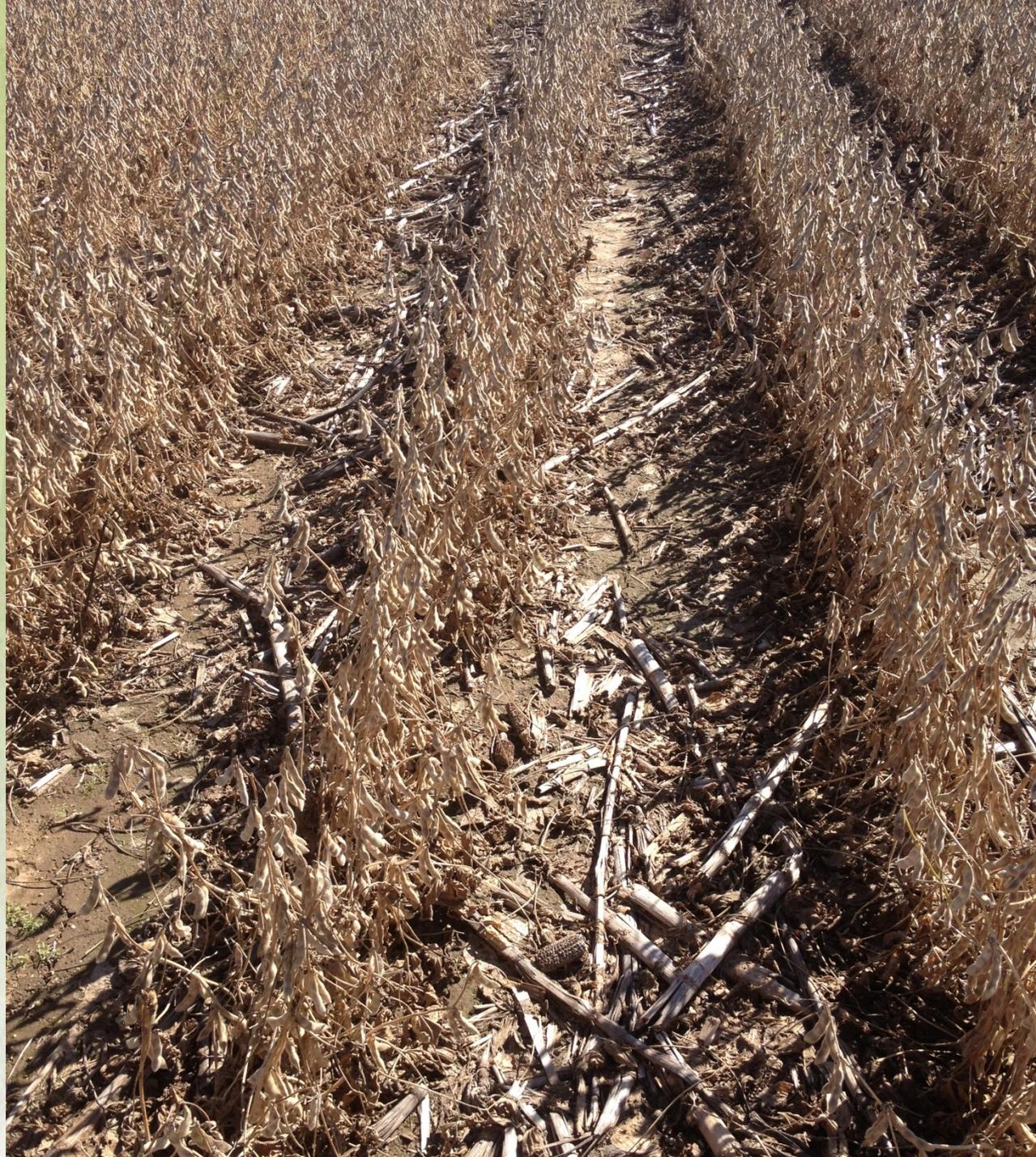
Summer
Mixture
(frost kill)



Baler & Grain Cart



Prior to 2013
Soybean
Harvest (corn
stalks from
2012)





Dryland Yields



- 2013 Very Dry spring and dry later summer
 - 60.1 bushel Soybeans; 40 bushel wheat (5 inches of rain after SB harvest)
- 2012 Severe Drought Year (60 days of 95 degrees or above)
 - Soybeans 45 bushels; Corn 130 Bushels into wheat stubble and 105 Bushels into wheat stubble with brassica cover crop
- 2011 Slightly Above average Rainfall
 - Corn 160 Bushels 50 Bushel Wheat
- County Average Corn 85 bushels, Wheat 35 bushels, Soybeans 30 bushels

SHMS Keys

- Implementation phase (compaction, residue breakdown slow, N-tie-up following wheat, equipment adjustments balling up residue in drill/planter)
- Planting depth, uniformity of stand important
- Residue Uniformity, PolySkids allow header to run on ground for soybeans without any problems with corn stalks; wheat stubble height, fall grazing on corn stubble
- Rotate herbicides and crops to minimize to minimize weed resistance (water hemp resistance biggest challenge)
- Keep sprayer in top condition (do your own spraying)
- Residue cover = money in hot dry conditions (need more residue)
- Cover crops, C:N ratio 25, avoid brassica monoculture, limit water use, some years will not use cover crops, canopy and ground cover = less weeds and lower “E” in ET
- Uniform emergence is important (Corn 2-1/2; SB 1-1/2, Milo 2”) (deeper than we used to, consider planting dates)
- Fertilizer mgt (gradually need less N fertilizer, split apply N on wheat for yields by first node, P starter for corn and SB, manage pH)

Late September Rainfall

