

## MANAGEMENT PRACTICES – 2016

### AREA IV SCD/ARS RESEARCH FARM

#### AREA-F FIELD OPERATIONS, NW ¼ Section 17 T138N R81W

**FIELD F1** This area has been excluded from the total acreage leased by AREA IV SCDs since 1987.

#### **FIELD F2** GLENN SPRING WHEAT

Previous crop – Pioneer sunflowers

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.

05/12/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 85 lb/ac 11-52-0.

06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.

08/23/16 Field harvested w/JD 9650 combine and 35 ft head (45.9 bu/ac).

09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

#### **FIELD F3, OVERLAND WINTER WHEAT**

Previous crop – Spring wheat

10/01/15 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 70 lb/ac 11-52-0.

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/15/16 Contractor sprayed w/Gold Sky @ 16 oz/ac + Propimax @ 3 oz/ac + 2,4-D LV6 @ 8 oz/ac.

07/13/16 Field swathed w/Versatile 20 ft swather.

07/21/16 Field harvested w/JD 9650 and pickup head (73.1 bu/ac).

08/18/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 8 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

#### **FIELD F4, NUTECH 09M2 SUNFLOWERS**

Previous crop- Winter wheat

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/16/16 Field sprayed w/Spartan @ 4 oz/ac + Durango @ 32 oz/ac + Jackhammer @ 2 qt./100 gal.

06/06/16 Field planted w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.

08/11/16 Contractor sprayed field w/Paradigm @ 4 oz/ac + Trophy Gold @ 2.2 oz/ac.

10/27/16 Field harvested w/JD 9650 and all-crop head (~2500 lb/ac).

#### **FIELD F5, NEXERA 1012RR CANOLA**

Previous crop – Pioneer soybeans

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/16/16 Field sprayed w/Durango @ 32 oz/ac + Jackhammer @ 1 qt/100 gal.

05/18/16 Field seeded w/JD 750 Drill @ 8 lbs/ac + 100 lb/ac ammonium sulfate.

08/15/16 Contractor swathed field w/ New Holland 30 ft swather.

09/01/16 Field harvested w/JD 9650 combine and pickup head (1285 lb/ac).

#### **FIELD F6, PIONEER CORN**

Previous crop – Buckwheat

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/16/16 Field sprayed w/Durango @ 32 oz/ac + Jackhammer @ 1 qt/100 gal.

05/19/16 Field planted w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.

06/19/16 Contractor sprayed field w/Durango @ 32 oz/ac + Status @ 3.2 oz/ac + Jackhammer @ 2 qt/100 gal.

10/07/16 Field harvested w/JD 9650 combine and all-crop head (151 bu/ac).

#### **AREA-G FIELD OPERATIONS, SW ¼ Section 8 T138N R81W**

#### **FIELD G1 (FORMER TREE PLOT), CROPLAN 458E SUNFLOWERS**

Previous crop – Pioneer sunflowers

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

05/16/16 Field sprayed w/Spartan @ 4 oz/ac + Durango @ 28 oz/ac + Jackhammer @ 2 qt./100 gal.

05/27/16 Field planted w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.

10/14/16 Field harvested w/JD 9650 combine and 6-row all crop head (~2500 lb/ac).

#### **FIELD G1, GLENN SPRING WHEAT**

Previous crop – Spring wheat

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

- 05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.
- 05/13/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 70 lb/ac 11-52-0.
- 06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.
- 08/25/16 Field harvested w/JD 9650 combine and 35 ft. straight head (43.8 bu/ac).

**FIELD G2, CROPLAN 458E SUNFLOWERS**

Previous crop – Pioneer corn

- 03/18/16 Contractor broadcast urea @ 80 lb N/ac.
- 05/16/16 Field sprayed w/Spartan @ 4 oz/ac + Durango @ 32 oz/ac + Jackhammer @ 2 qt./100 gal.
- 05/27/16 Field seeded w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.
- 08/05/16 Contractor sprayed field w/Paradigm @ 4 oz/ac + Trophy Gold @ 2.2 oz/ac.
- 10/17/16 Field harvested w/JD 9650 and all-crop header (~2500 bu/ac).

**FIELD G3, GLENN SPRING WHEAT**

Previous crop – Fallow

- 03/18/16 Contractor broadcast urea @ 30 lb N/ac.
- 05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.
- 05/13/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 85 lb/ac 11-52-0.
- 06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.
- 08/25/16 Field harvested w/JD 9650 and 35 ft. straight head (43.8 bu/ac).
- 09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

**FIELD G4, FALLOW**

Previous management – Spring wheat

- 05/16/16 Field sprayed w/Durango @ 32 oz/ac + Jackhammer @ 1 qt/100 gal.
- 07/07/16 Contractor sprayed w/Durango @ 32 oz/ac + Jackhammer @ 2 qt/100 gal.
- 09/17/16 Contractor sprayed w/Duarango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

## **AREA-H FIELD OPERATIONS, NE ¼ Section 18 T138N R81W**

### **FIELD H1, VERNAL ALFALFA**

Previous crop – Alfalfa

- 06/04/16 First cutting done by Northern Lights Dairy (1.08 ton/ac @ 15% moisture).
- 07/14/16 Second cutting done by Northern Lights Dairy (0.92 ton/ac @ 15% moisture).
- 08/09/16 Third cutting done by Northern Lights Dairy (0.64 ton/ac @ 15% moisture).

### **FIELD H2, PIONEER SOYBEANS**

Previous crop – Pioneer corn

- 03/18/16 Contractor broadcast urea @ 50 lb urea/ac.
- 05/09/16 Field sprayed w/Cornerstone 5 Plus @ 32 oz/ac + Class Act @ 1 qt/100 gal.
- 05/22/16 Field seeded w/JD 1750 MaxEmerge XP planter @ 180,000 seeds/ac.
- 06/19/16 Contractor sprayed field w/Durango @ 32 oz/ac + Jackhammer @ 1.5 qt/100 gal.
- 09/27/16 Field harvested w/JD 6620 and 15 ft. flex head (39 bu/ac).

### **FIELD H3 WEST, PIONEER SOYBEANS**

Previous crop – Pioneer corn

- 03/18/16 Contractor broadcast urea @ 50 lb urea/ac.
- 05/16/16 Field sprayed w/Durango @ 32 oz/ac + Jackhammer @ 1 qt/100 gal.
- 05/20/16 Field seeded w/JD 1750 MaxEmerge XP planter @ 180,000 seeds/ac.
- 06/19/16 Contractor sprayed field w/Durango @ 32 oz/ac + Jackhammer @ 1.5 qt/100 gal.
- 10/13/16 Field harvested w/JD 6620 and 15 ft. flex head (39 bu/ac).

### **FIELD H3 EAST, PIONEER CORN**

Previous crop – Spring wheat

- 03/18/16 Contractor broadcast urea @ 80 lb N/ac.
- 05/16/16 Field sprayed w/Durango @ 32 oz/ac + @ 1 qt/100 gal.
- 05/17/16 Field planted w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.
- 06/19/16 Sprayed field w/Durango @ 32 oz/ac + Status @ 3.2 oz/ac + Jackhammer @ 2 qt/100 gal.
- 10/08/16 Field harvested w/JD 9650 and 6-row all crop head (151 bu/ac).

### **FIELD H3 SOUTH (“waterhole”), PIONEER CORN**

Previously – Flooded

Identical management as above except no fertilizer was applied in anticipation that it might eventually flood (did not happen).

Estimated yield – ~45 bu/ac.

### **FIELD H4, SOIL QUALITY MANAGEMENT**

See *‘Management Strategies for Soil Quality’* on page 36

### **FIELD H4, PIONEER CORN**

Previous crop – Dry peas

- 03/18/16 Contractor broadcast urea @ 80 lb N/ac.
- 05/16/16 Field sprayed w/Durango @ 32 oz/ac + @ 1 qt/100 gal.
- 05/19/16 Field planted w/JD 1750 MaxEmerge XP planter @ 24,000 seeds/ac.
- 06/19/16 Sprayed field w/Durango @ 32 oz/ac + Status @ 3.2 oz/ac + Jackhammer @ 2 qt/100 gal.
- 10/07/16 Field harvested w/JD 9650 combine and all-crop head (132.5 bu/ac).

### **FIELD H4, GLENN SPRING WHEAT**

Previous crop – Pioneer soybeans

- 03/18/16 Contractor broadcast urea @ 50 lb N/ac.
- 05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.
- 05/10/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 85 lb/ac 11-52-0.
- 06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.
- 08/19/16 Field harvested w/JD 9650 and 35 ft straight head (47.5 bu/ac).
- 09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

### **FIELD H4, OVERLAND WINTER WHEAT**

Previous crop- Spring wheat

- 09/30/15 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 70 lb/ac 11-52-0.
- 03/18/16 Contractor broadcast urea @ 80 lb N/ac.
- 05/15/16 Contractor sprayed w/Gold Sky @ 16 oz/ac + Propimax @ 3 oz/ac + 2,4-D LV6 @ 8 oz/ac.
- 07/14/16 Field swathed w/Versatile 20 ft. swather.
- 07/22/16 Field harvested w/JD 9650 combine and 35ft. pickup head (73.1 bu/ac).

- 08/18/16 Contractor sprayed w/Duarango @ 32 oz/ac + 2, 4-D LV6 @ 8 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.
- 09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

#### **FIELD H4, NETTE DRY PEAS**

Previous crop- Winter wheat

- 05/06/16 Field seeded w/JD 750 drill @ 140 lb/ac seed + 50 lb/ac 11-52-0.
- 07/29/16 Contractor desiccated field w/Durango @ 32 oz/ac + Sharpen @ 2 oz/ac + Jackhammer @ 2 qt/100 gal.
- 08/09/16 Field harvested w/JD 6620 w/15 ft flex head (44.2 bu/ac).

#### **FIELD H5, GLENN SPRING WHEAT**

Previous year – Pioneer sunflowers

- 03/18/16 Contractor broadcast urea @ 80 lb N/ac.
- 05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.
- 05/09/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 85 lb/ac 11-52-0.
- 06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.
- 08/17/16 Field harvested w/JD 9650 combine and 35 ft. straight head (49.0 bu/ac).
- 09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

#### **AREA-I FIELD OPERATIONS, NE ¼ Section 20 T138N R81W**

Much of Area I has been designated for the establishment of plots and accompanying larger field as part of a multi-location ARS research project known as the Long-Term Agricultural Research (LTAR) project. In preparation, the entire area was planted to spring wheat to help establish a uniform starting point for this research.

#### **FIELD I1, ELGIN ND SPRING WHEAT (Continuous spring wheat 31 yrs).**

This field will remain as a continuous spring wheat treatment.

Yield - 56.8 bu/ac

PREVIOUS FIELD DESIGNATIONS AND CROPS GROWN IN 2015

Field I2 – SY Soren spring wheat

Field I3 – Croplan 460E Sunflowers

Field I4 – Elgin ND Spring wheat

09/20/15 Field planted to winter wheat.

05/01/16 Contractor sprayed winter wheat in preparation for LTAR project. Used Durango @ 32 oz/ac + Banvel @ 4 oz/ac + Downdraft @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.

### Field I5 – Overland Winter wheat

### Field I6 – Croplan 460E Sunflowers

Yield measurement specific to this field was 31.5 bu/ac.

### Field I7, Elgin ND Spring wheat

Avg yield (I2 through I7) – 31.5 to 48 bu/ac

### Current year's management on Area I

03/18/16 Contractor broadcast urea @ 80 lb N/ac.

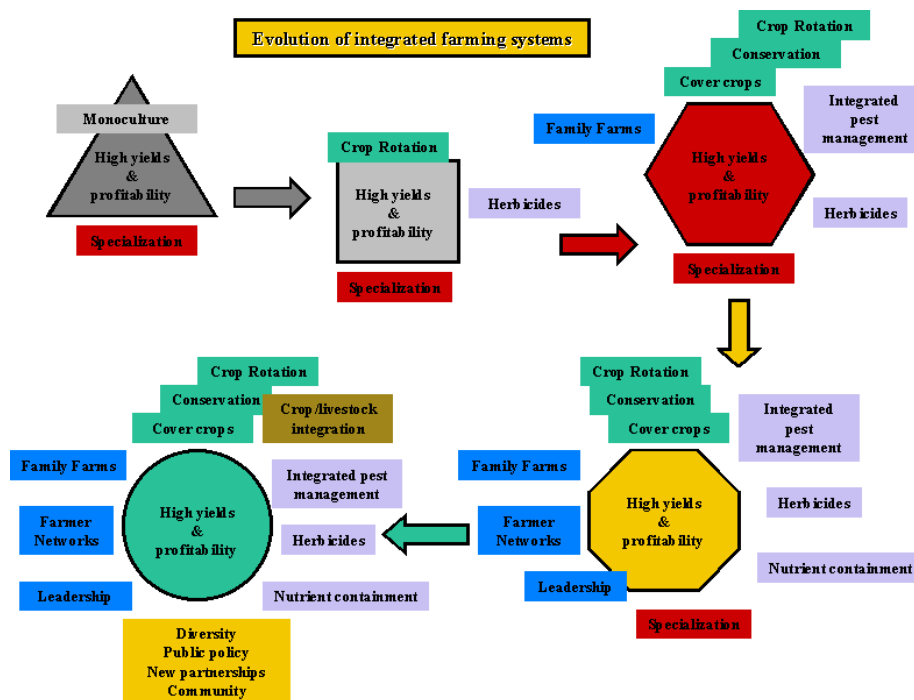
05/03/16 Contractor sprayed field w/Durango @ 32 oz/ac + Sterling Blue @ 4.5 oz/ac + Downdraft (drift retardant) @ 4.5 oz/ac + Jackhammer @ 2 qt/100 gal.

05/06/16 Field seeded w/Bourgault drill @ 1.3 million seeds/ac + 80 lb/ac 11-52-0.

06/06/16 Contractor sprayed w/Perfect Match @ 16 oz/ac + 2,4-D, LV6 @ 8 oz/ac + Propimax EC @ 3 oz/ac + Linkage @ 1 qt/100 gal.

08/24/16 Field harvested w/JD 9650 w/35 ft straight head (avg. yield 40 to 48 bu/ac).

09/17/16 Contractor sprayed w/Durango @ 32 oz/ac + 2, 4-D LV6 @ 12 oz/ac + Detonate @ 4 oz/ac + Jackhammer @ 2 qt/100 gal.



Summary of Area IV Research Farm Yields.

Field	Crop	Variety	Yield (per ac)
F2	Spring wheat	Glenn	45.9 bu
F3	Winter wheat	Overland	73.1 bu
F4	Sunflower	NuTech 09M2	~2500 lb
F5	Canola	Nexera	1285 lb
F6	Corn	NuTech 5N-183 3000GT	151 bu
G2	Sunflower	Cropland 458E	~2500 lb
G3	Spring wheat	Glenn	43.8
G4	Fallow		----
H1	Alfalfa	1 <sup>st</sup> cutting	1.08 T
		2 <sup>nd</sup> cutting	0.92 T
		3 <sup>rd</sup> cutting	0.64 T
H2	Soybeans	Asgrow AG 0434	39 bu
H3 west	Soybeans	Asgrow AG 0434	39 bu
H3 east	Corn	NuTech 5N-183 3000GT	151 bu
H4 (a)	Corn	NuTech 5N-183 3000GT	132.5 bu
H4 (b)	Spring wheat	Glenn	47.5 bu
H4 (c)	Winter wheat	Overland	73.1 bu
H4 (d)	Dry peas	Nette	44.2 bu
H5	Spring wheat	Glenn	49.0 bu
I1	Spring wheat	Glenn	56.8 bu
I2	Spring wheat	Glenn	47.0 bu
I3, I4, I5, I7	Spring wheat	Glenn	~43 bu
I6	Spring wheat	Glenn	31.5 bu

**Justus von Liebig's  
"Law of the Minimum"  
published in 1873**

"If one growth factor/nutrient is deficient, plant growth is limited, even if all other vital factors/nutrients are adequate...plant growth is improved by increasing the supply of the deficient factor/nutrient"

