

# Direct Seeding into Heavy Irrigated Residue as an Alternative to Burning

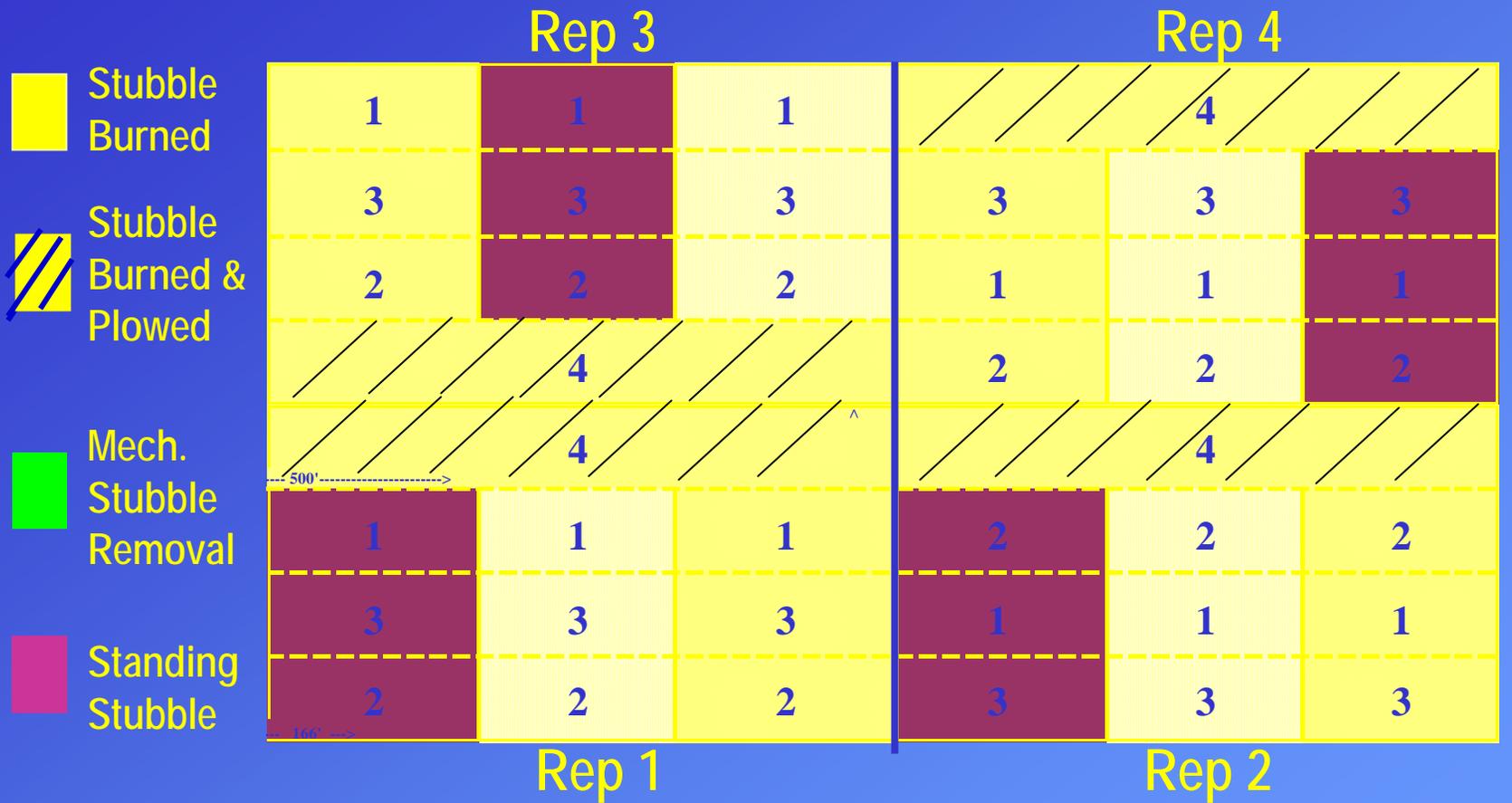
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# Treatments

- **Three-year rotation of winter wheat-spring barley-winter canola.**
- **Three residue management methods: Standing stubble, stubble mechanically removed, and stubble burned.**
- **Continuous annual winter wheat with burn and moldboard plow included as check.**
- **All treatments are replicated four times.**

# Irrigated Cropping Systems Plot Map, Lind, 2004 Crop Year



T 1: Spring Barley

T 3: Winter Wheat

T 2: Spring Canola

T 4: Burn, Plow, Cont. WW



# Irrigation

- **Fall: six inches of water.**
- **Spring (after barley is emerged): three inches of water.**
- **Final: six inches of water applied mid-May to early-June.**
- **Total Water Applied: fifteen inches**

# Fertility

- Total fertilizer per acre: 170 lb. nitrogen, 30 lb phosphorous, and 30 lb sulfur.
- Fall seeded crops: 120 lb nitrogen, with 50 lb nitrogen “top dress” in the spring.
- Spring seeded barley: Total nutrients applied at time of seeding.
- All direct seedings use liquid fertilizer with a dry fertilizer “top dress” (exception – spring barley uses all liquid).
- The conventional burn-plow treatments used only dry fertilizer.

# Seeding

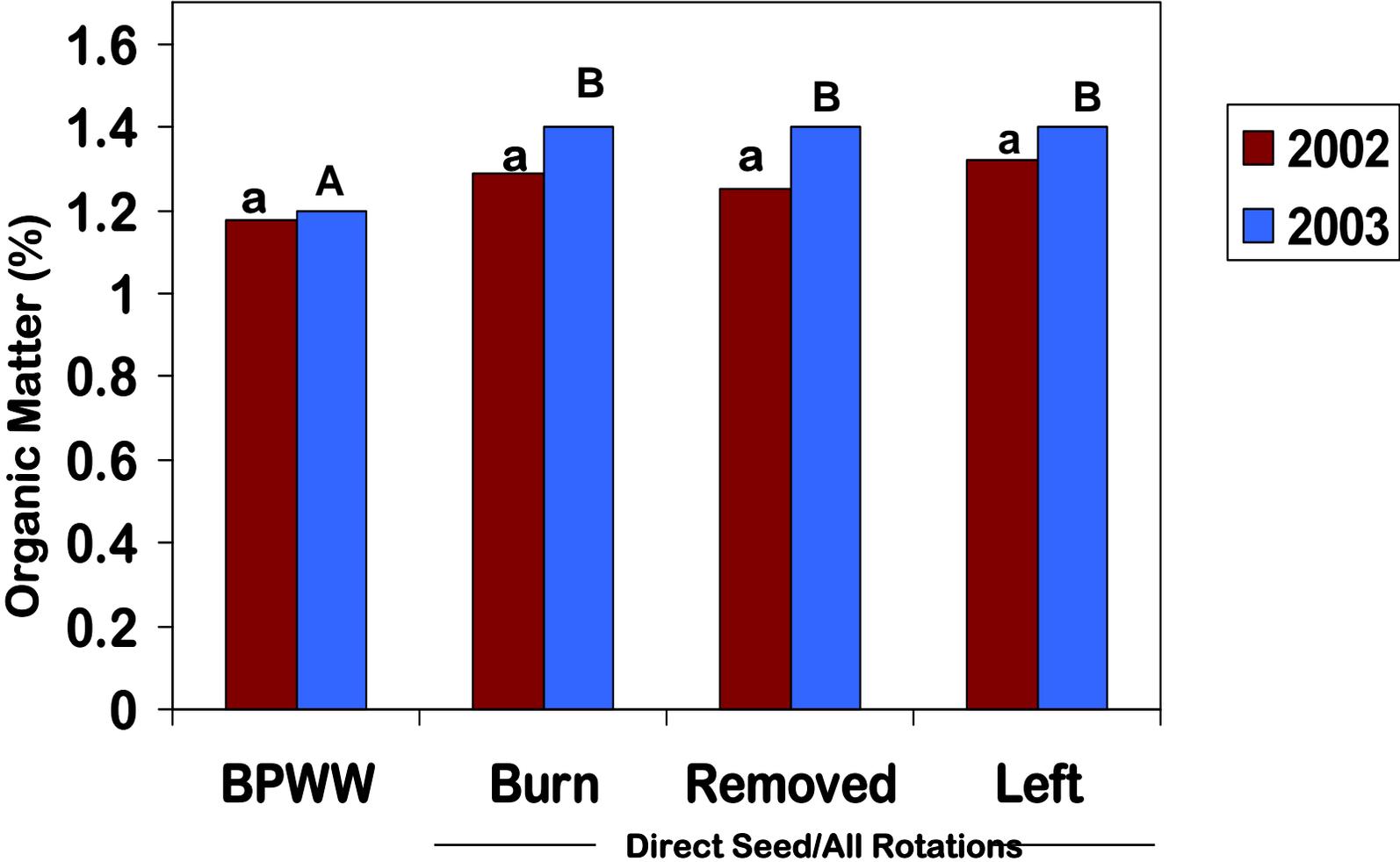
- All no-till plots seeded with the Cross-Slot drill
- The burn-plow plots seeded with a conventional disk drill



# Winter wheat

2003 12 18

# Organic Matter



Direct Seeding into Irrigated Stubble without Burning



2003 4 11



2004 5 3



2004 6 17

Rat-tail fescue



2003 5 27



2004 8 17



2004 5 22



# Irrigated spring barley



# Grain yields of irrigated winter wheat

	Winter Wheat (bu/a)				
	2001	2002	2003	2004	Avg.
Stubble burned	85	106	113 a	102	100 a
Stubble mech. removed	67	110	96 a	96	92 bc
Standing stubble	69	107	101 a	92	94 ab
Burn and plow	75	97	74 b	99	86 c
LSD (0.05)	NS	NS		NS	

# Grain yields of irrigated spring barley

	Spring barley (ton/a)				
	2001	2002	2003	2004	Avg.
Stubble burned	3.03	2.21	2.39	2.61	2.56
Stubble mech. removed	2.97	2.33	2.24	2.55	2.52
Standing stubble	2.80	2.26	2.08	2.53	2.42
LSD (0.05)	NS	NS	NS	NS	NS

# Grain yields of irrigated canola

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	Canola (lb/a)				
	2001	2002	2003	2004	Avg.
Stubble burned	2590	2500	1030	1120	1810
Stubble mech. removed	2500	2230	1140	1140	1750
Standing stubble	2290	2190	1330	1050	1710
LSD (0.05)	NS	NS	NS	NS	NS

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Spring canola planted in 2001, 2003 and 2004 when winter canola failed.



Lind Field Day

Average attendance = 190

101 6 14

# Other Measurements

- **Soil water dynamics**
- **Root diseases**
- **Weed ecology**
- **Economics**

# Thank you!

- DOE for financial and technical support
- Special thank you to Karen Wood and those working with her
- Advisory committee
- Steve Schofstoll and Bruce Sauer

**QUESTIONS?**

