No-Till Sowing into Standing Irrigated Stubble Instead of Burning

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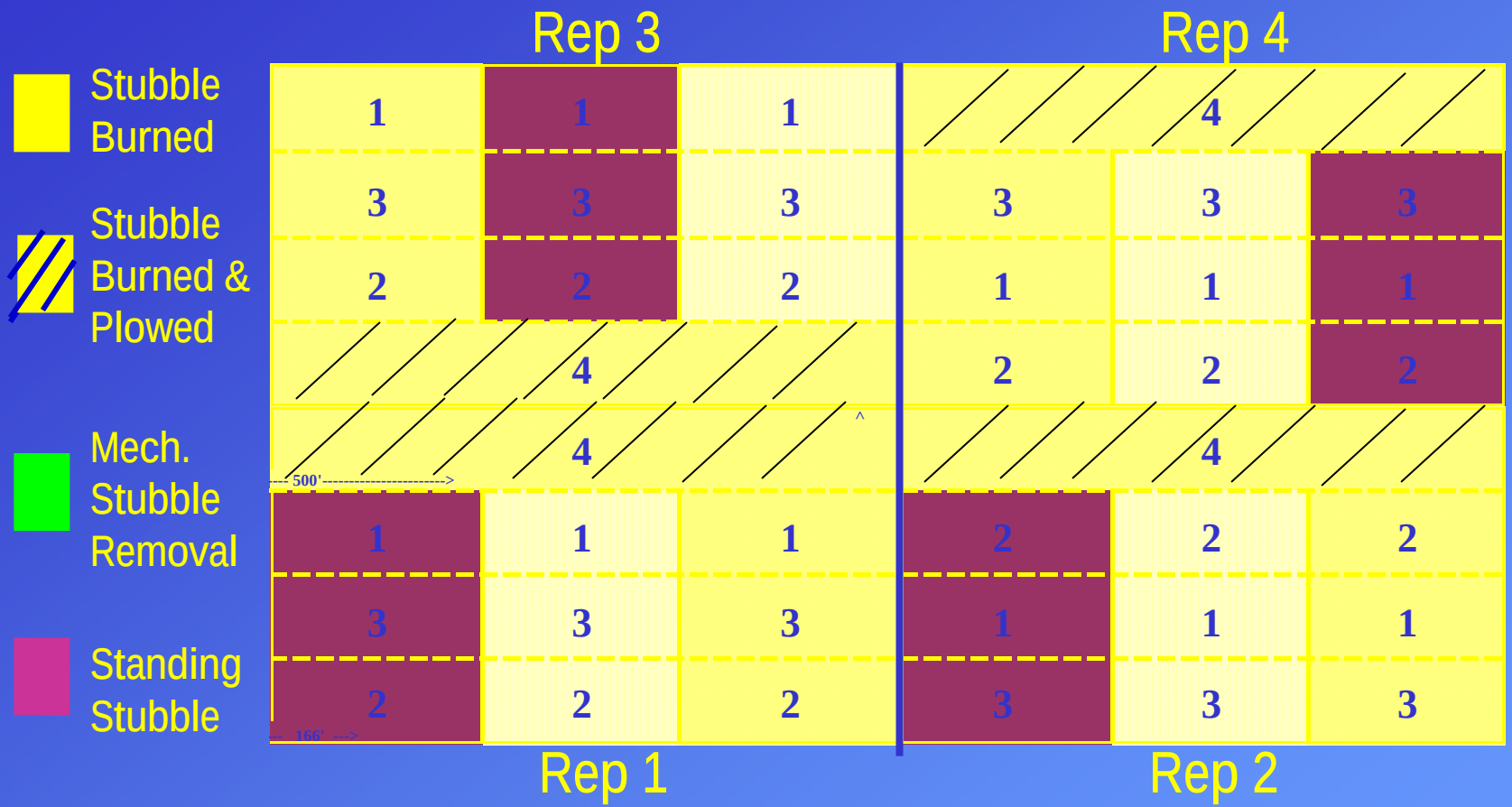
Treatments

- 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, 2006 Crop Year



T 1: Spring Barley

T 2: Spring Canola

T 3: Winter Wheat

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**

Seeding

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


WSU

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.**


Winter wheat
2003 12 18

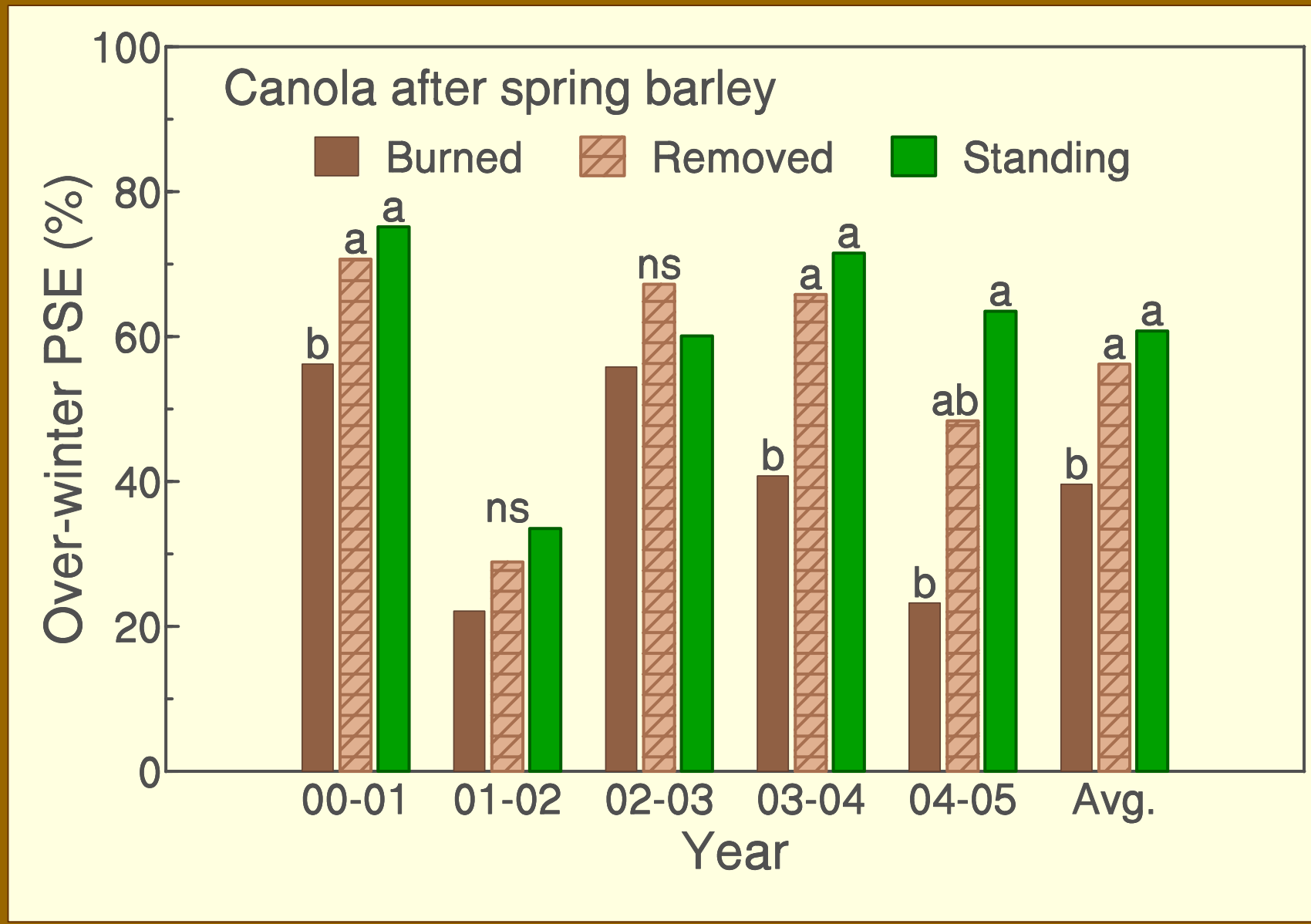

2003 4 11

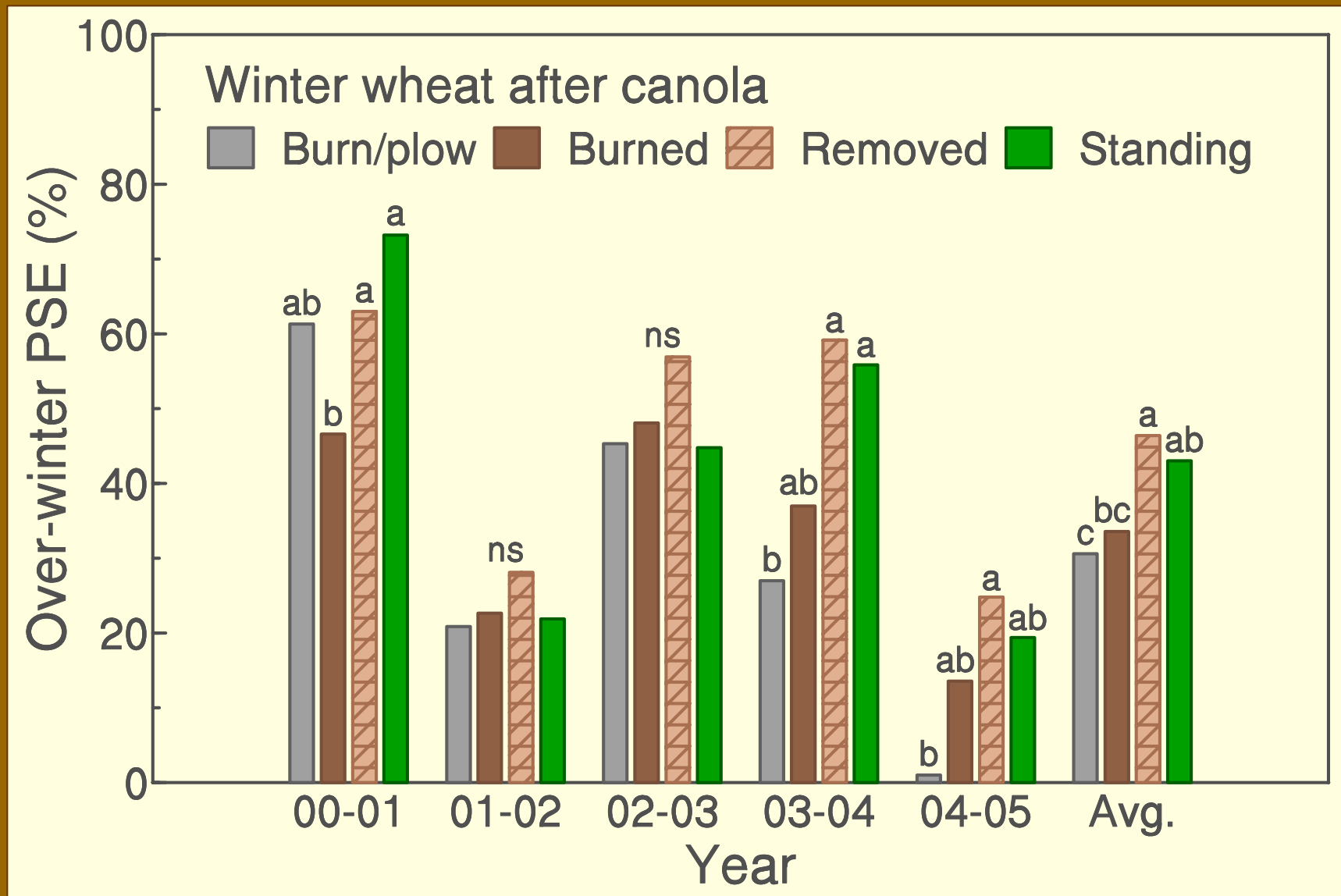

2004 5 3


Barley- burned
Barley- standing stubble

Measurements

- Soil water dynamics
- Root diseases
- Weed ecology
- Soil microbiology
- Grain yield
- Economics


Canola after spring barley
Burned
Removed
Standing
Over-winter PSE (%)
100
80
60
40
20
0
b
a
a
ns
ns
a
b
a
a
b
ab
a
b
a
a
00-01
01-02
02-03
03-04
04-05
Avg.
Year


Winter wheat after canola
Burn/plow
Burned
Removed
Standing
Over-winter PSE (%)
100
80
60
40
20
0
ab
b
a
a
ns
ns
b
ab
a
a
b
ab
a
ab
c
bc
a
ab
00-01
01-02
02-03
03-04
04-05
Avg.
Year

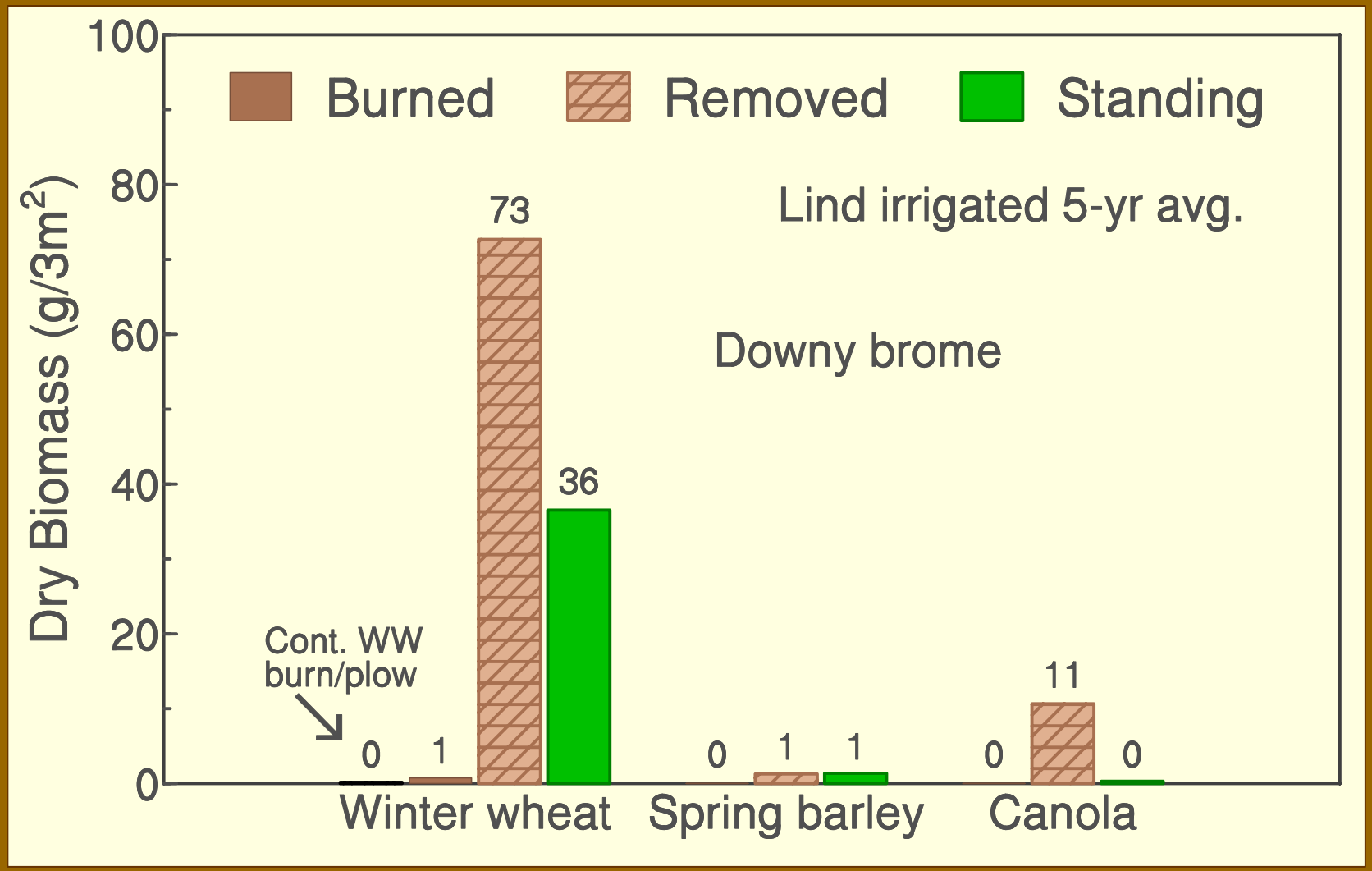

2006 4 18

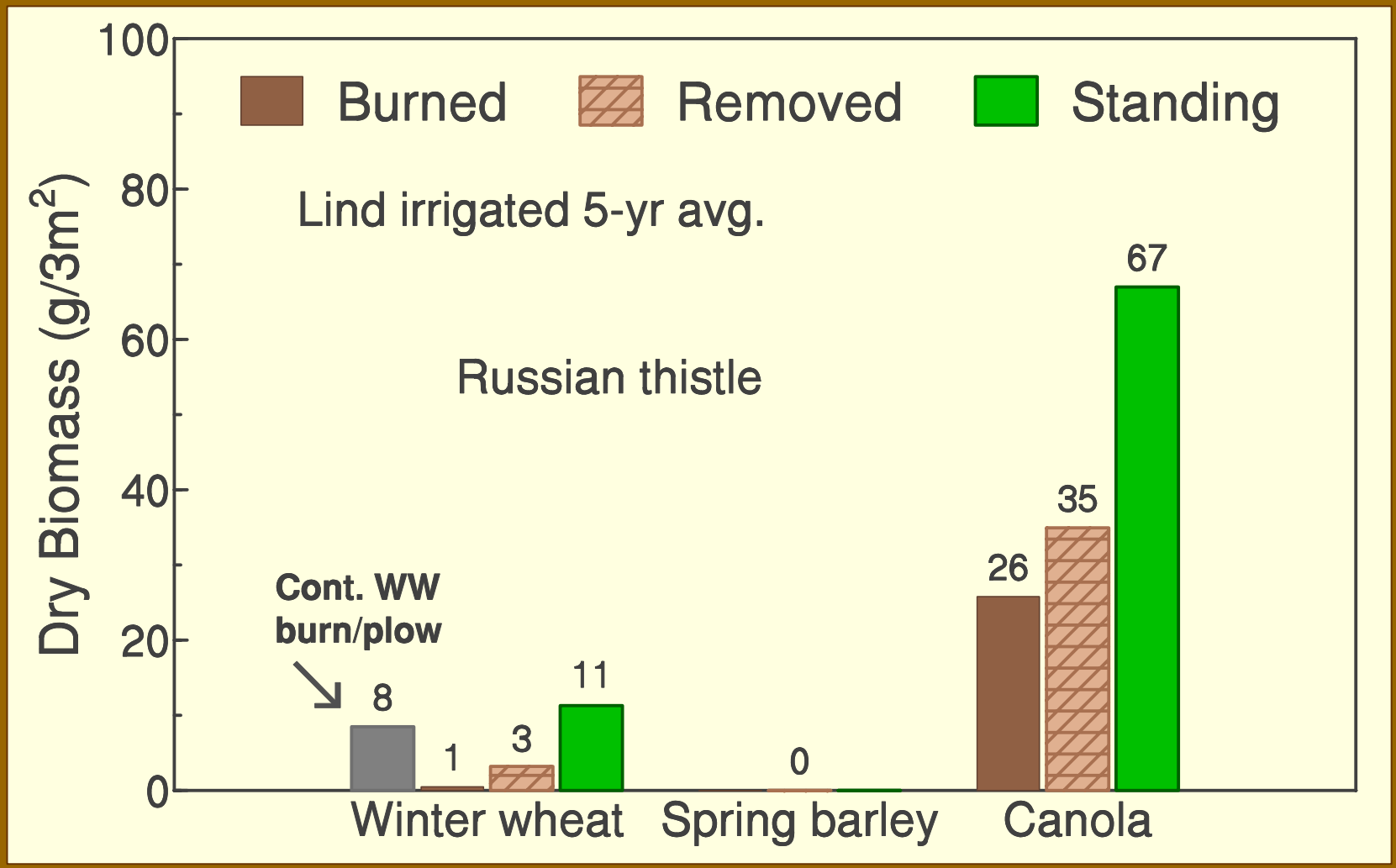

Rat-tail fescue
2003 5 27

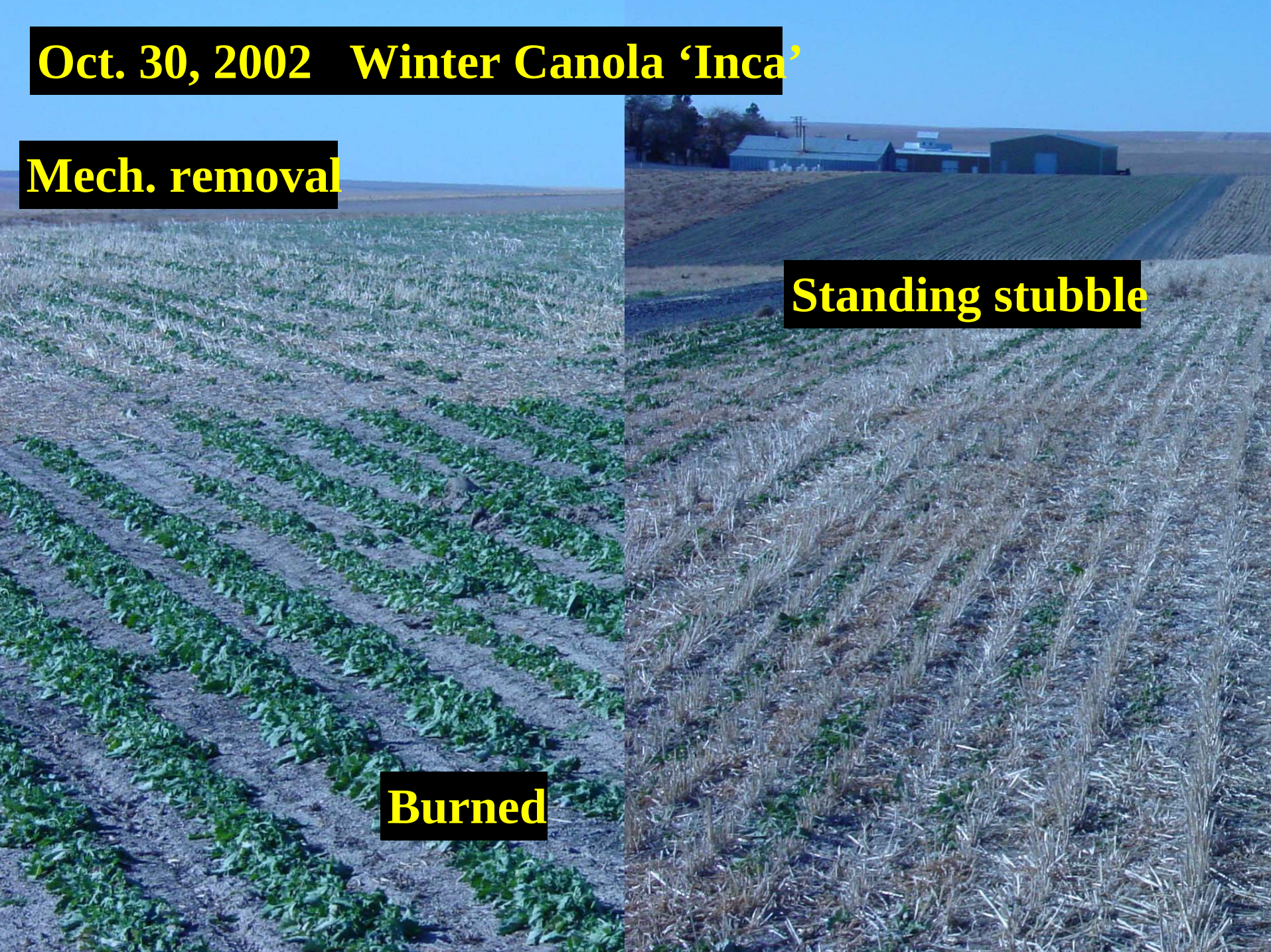

2006 5 3


2006 4 12

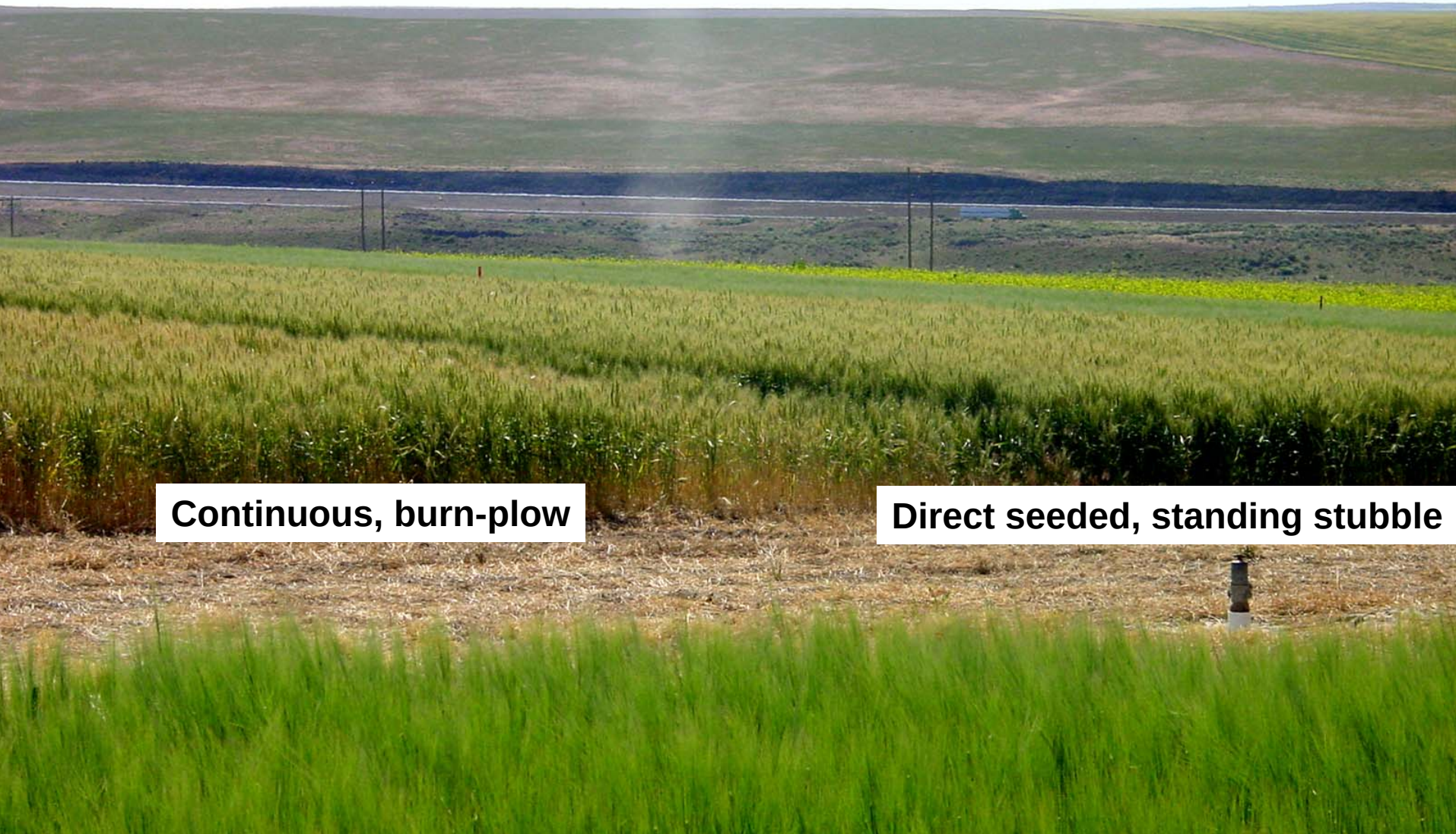

2006 5 17


Burned
Removed
Standing
Lind irrigated 5-yr avg.
Downy brome
Dry Biomass (g/3m2)
100
80
60
40
20
0
73
36
11
0
1
0
1
1
0
0
Cont. WW
burn/plow
Winter wheat
Spring barley
Canola


Burned
Removed
Standing
Lind irrigated 5-yr avg.
Russian thistle
Dry Biomass (g/3m2)
100
80
60
40
20
0
Cont. WW
burn/plow
8
1
3
11
0
26
35
67
Winter wheat
Spring barley
Canola


Oct. 30, 2002 Winter Canola 'Inca'
Mech. removal
Standing stubble
Burned

Take-all on Winter Wheat, 2003

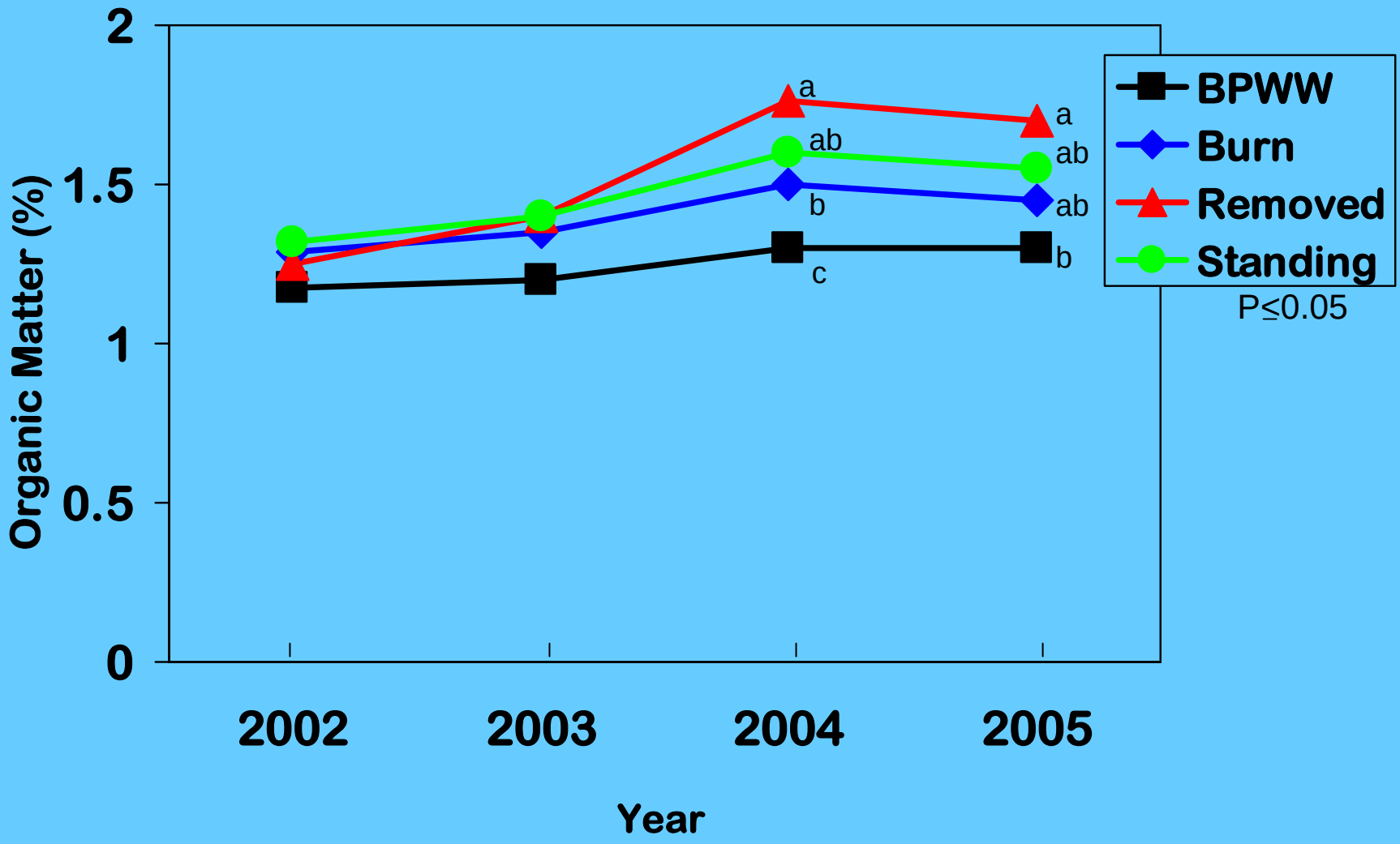


Effect of Tillage Treatments on DNA Levels of of *Ggt* (Take-all) in Winter Wheat, 2003

Tillage Treatment	DNA(pg/g soil)		Risk
Burn & Plow	1460	B	high
Mechanical Stubble Removal	26	A	low
Stubble Burned	28	A	low
Standing Stubble	27	A	low

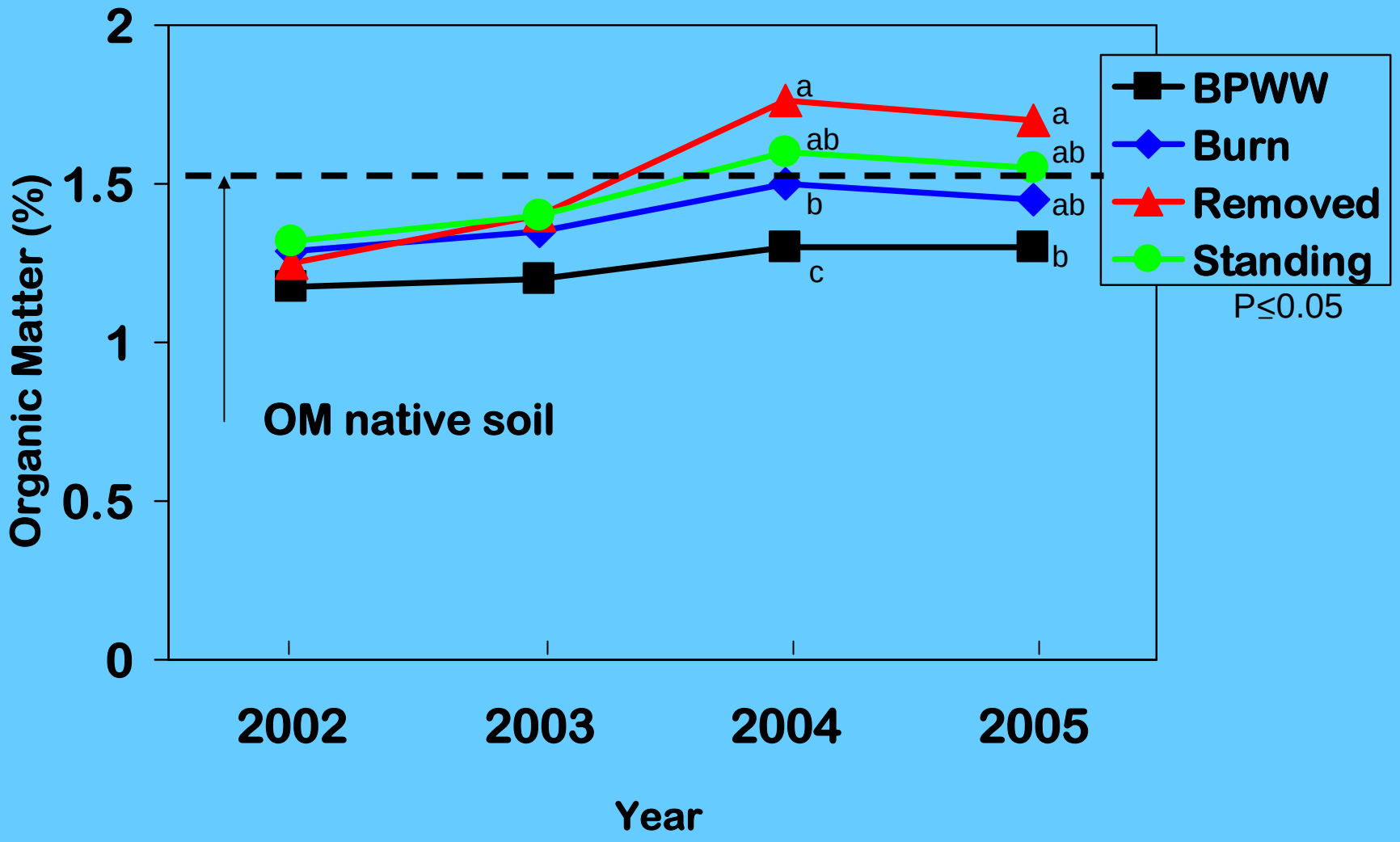
Mean separation with LSD

Organic Matter

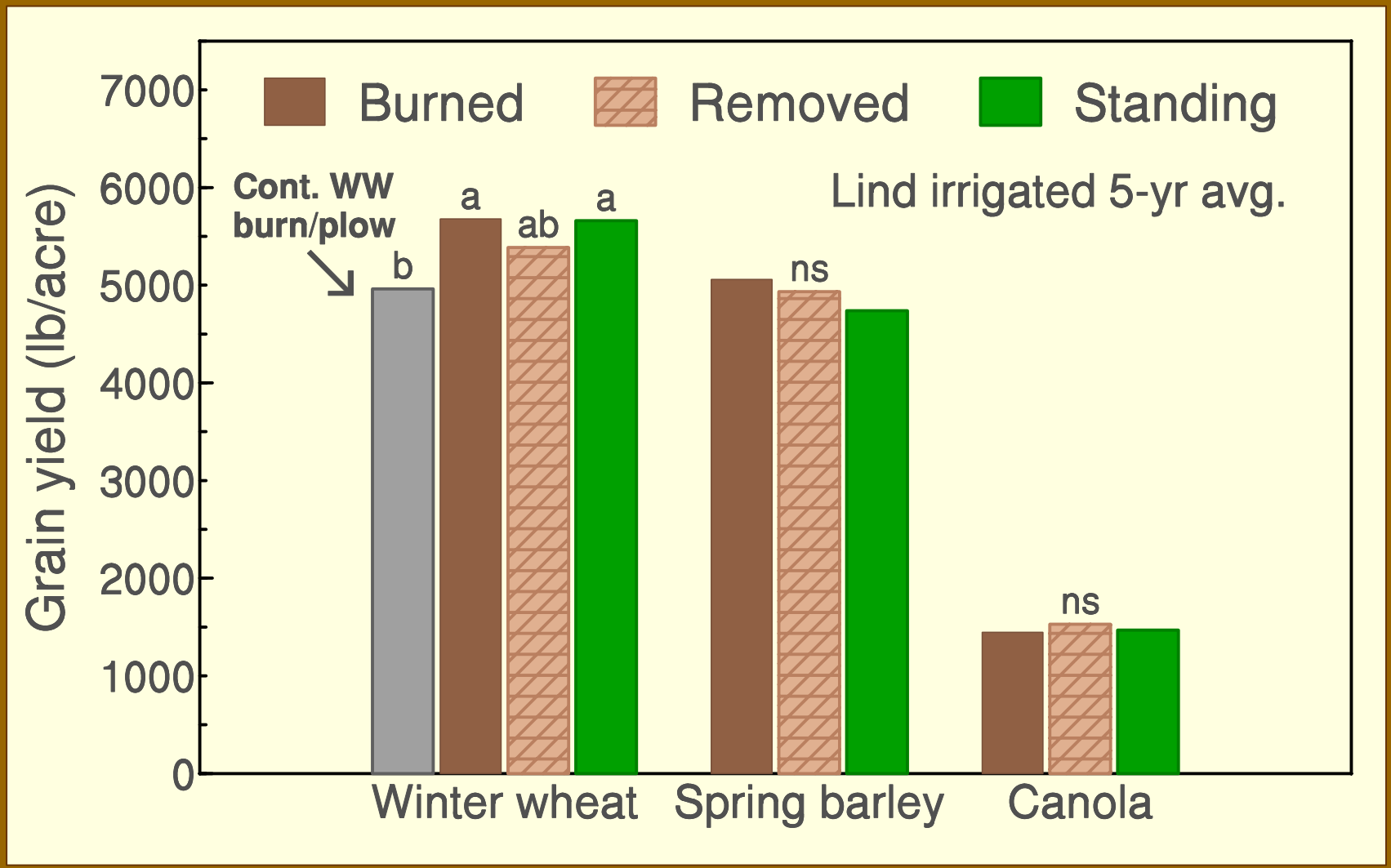


Direct Seeding into Irrigated Stubble

Organic Matter



Direct Seeding into Irrigated Stubble


Burned
Removed
Standing
Lind irrigated 5-yr avg.
Cont. WW
burn/plow
Grain yield (lb/acre)
7000
6000
5000
4000
3000
2000
1000
0
b
a
ab
a
ns
ns
Winter wheat
Spring barley
Canola

Publications

Paulitz, T.C., P.A. Okubara, and W.F. Schillinger. 2006. First report of damping-off of canola caused by *Rhizoctonia Solani* AG 2-1 in Washington State. *Plant Disease* 90:829.

Upcoming

Schillinger et al. Agronomy, weeds, water, grain yields
Kennedy et al. Soil quality
Young et al. Economics
Paulitz et al. Diseases

Lind Field Day
June 2006