Management of Fresh Wheat Residue for Irrigated Winter Canola Production

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Objectives

1. Determine how four different WW residue management practices affect WC heath and yield.
2. Determine cause(s) for decline in WC vigor and yield as affected by WW residue management.
3. Test methods to retain WW residue without adversely affecting WC.
4. Disseminate results of research through field days, grower meetings, an extension bulletin, and a scientific journal article.

Theories

1. Straw produces toxic compounds.
2. Decomposing straw immobilizes nitrogen.
3. Excess straw interferes with drill performance.
4. Excess straw keeps soils too wet and cool.
5. Straw shades WC seedlings and interferes with photosynthesis.
6. Straw serves as a food base for soil-borne pathogens, increasing disease, especially for Pythium and Rhizoctonia.

Irrigated Winter Canola Experiment

Treatments (established on fresh irrigated winter wheat stubble):

1. Burn + double disk
2. Chop stubble + moldboard plow
3. Burn + direct seed
4. Direct seed into standing residue
5. Broadcast into not-yet-harvested wheat (New for CY 2014)

Randomized complete block design with four replicates (i.e., 20 plots). Each plot 100-ft long.

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Equipment hauled from the Lind Station to conduct the experiment

1. Wheel tractor (75 hp)
2. Stubble chopper
3. Double disk, 10 ft wide
4. Moldboard plow, 4 ft wide
5. Smeizer packer (pulled behind moldboard plow)
6. Kile hoe-opener drill, 8 ft wide
7. Plot sprayer
8. Plot combine

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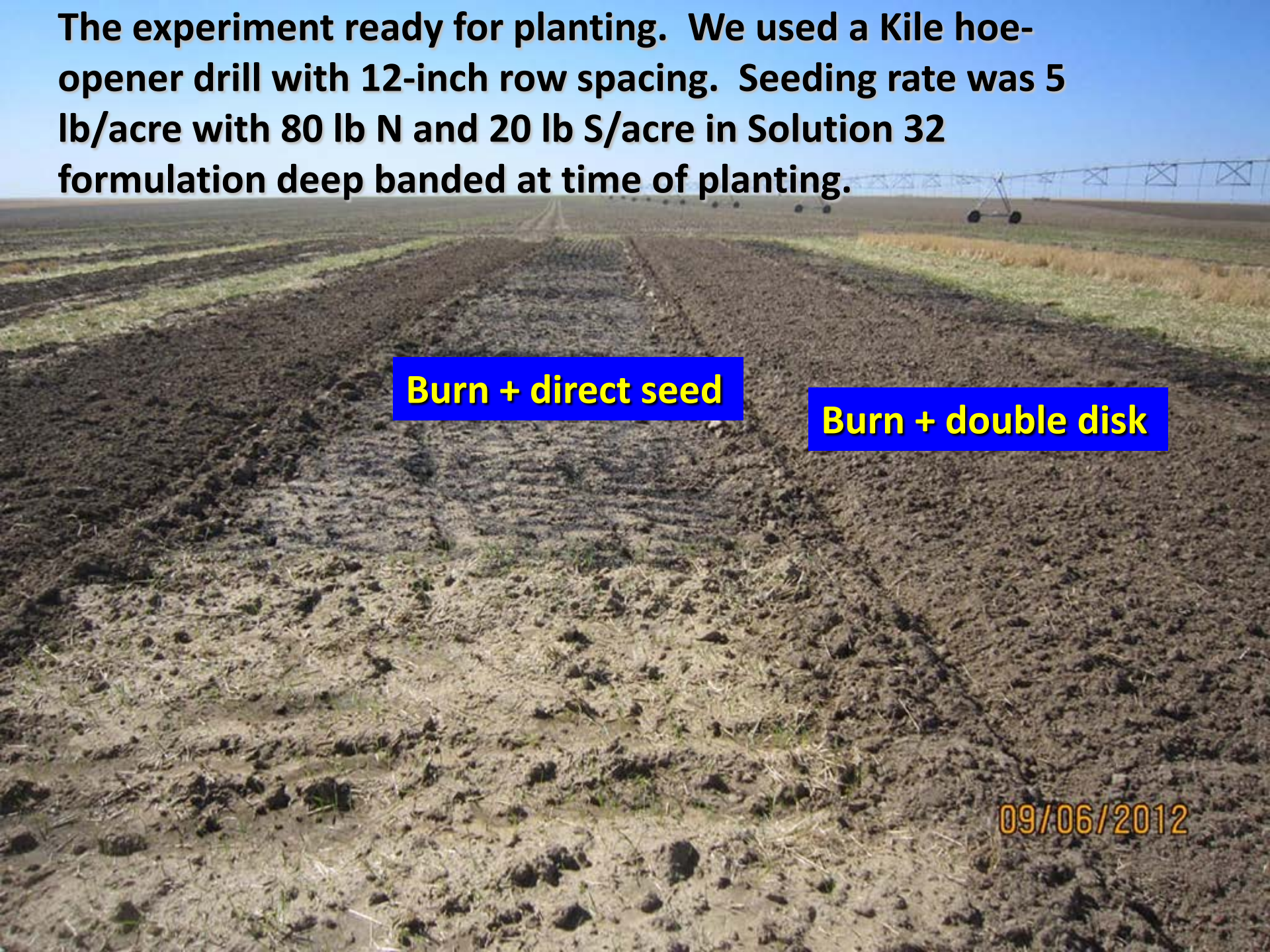
The experiment ready for planting. We used a Kile hoe-opener drill with 12-inch row spacing. Seeding rate was 5 lb/acre with 80 lb N and 20 lb S/acre in Solution 32 formulation deep banded at time of planting.



Chopped stubble + moldboard plow
Direct seeding into standing stubble
09/06/2012

Direct seeding winter canola into standing and undisturbed winter wheat stubble. We used a hoe opener no-till drill with 12-inch row spacing and openers staggered on three ranks. This drill was used to plant winter canola in all residue management treatments.

Newly emerged winter canola seedlings in standing stubble treatment 14 days after planting. Volunteer wheat was controlled with a later Assure II herbicide application.

Healthy canola with no root diseases in any treatment!
04/23/2013

Winter canola in standing stubble was shorter than other treatments in mid May (shown here), but plants in all treatments were the same height by the end of May.

Forty people attended a twilight outreach tour at the experiment site on May 30, 2013.

OUTREACH

Twilight tour on
May 30, 2013

ODESSA RECORD JUNE 6, 2013

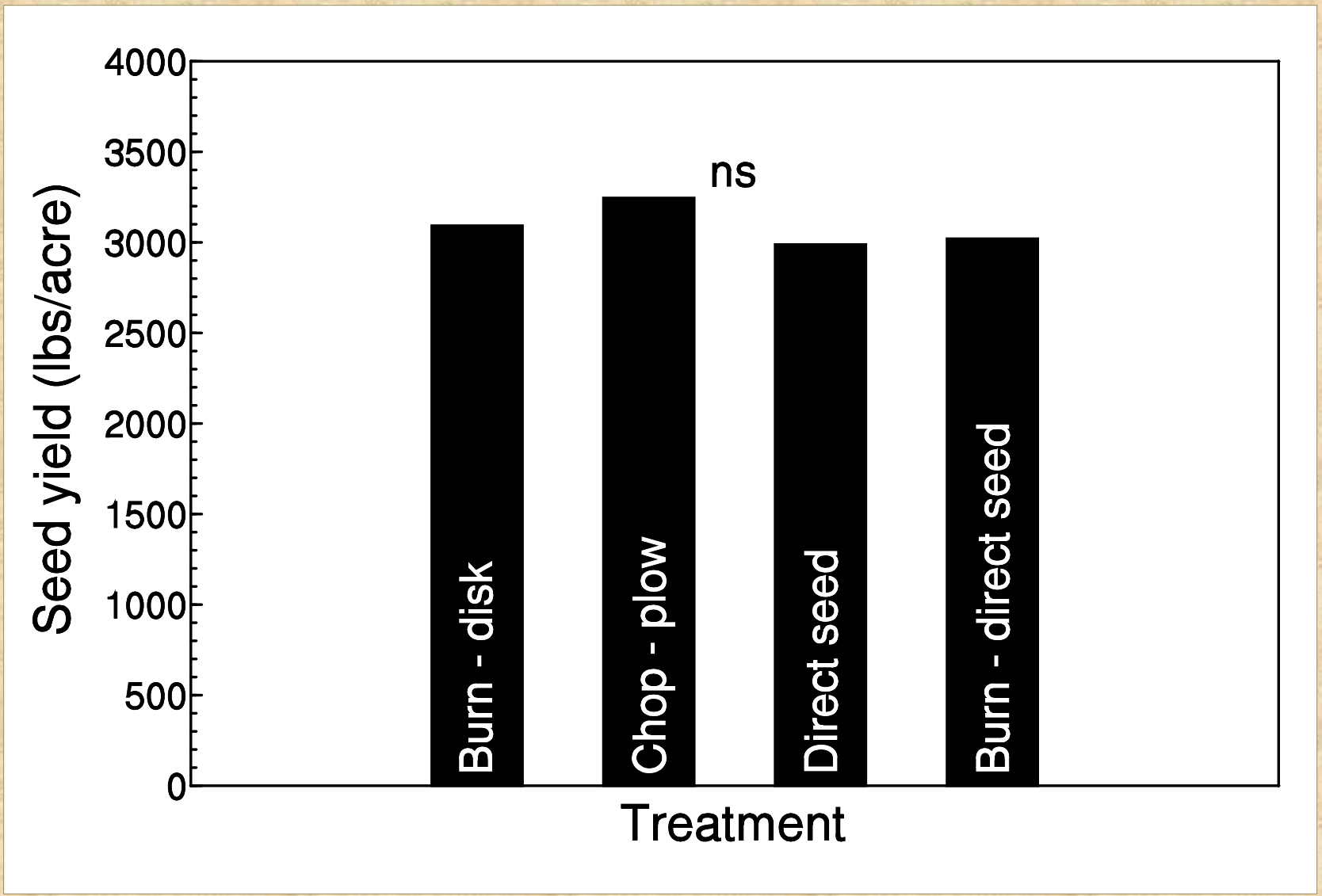
Schibel field tour informs farmers on canola planting

On May 30, Dr. William Schillinger of Washington State University and manager of the WSU's Lind Research Station (and a product of Odessa High School) told farmers and other interested visitors about the field plots of canola representing four different direct-seeding methods for planting canola in rotation with wheat and potatoes. The plots are evaluated throughout the growing season to see what differences appear in the crops planted using the various methods.

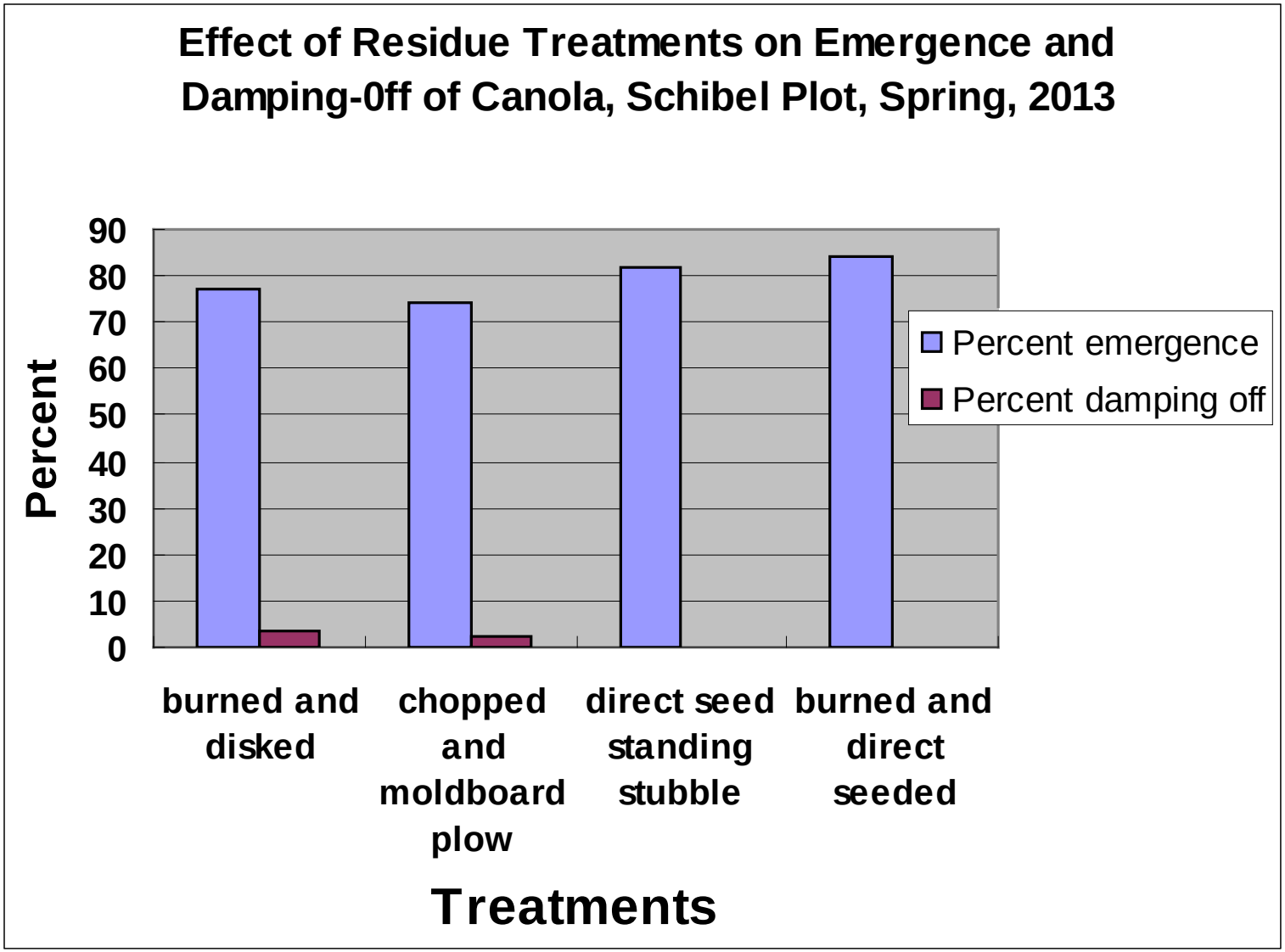
Area farmer Jeff Schibel volunteered the use of a portion of his land for the test plots. Between 30 and 40 visitors attended the tour. At its conclusion, the visitors were treated by the Wilbur-Ellis Corporation to ice-cream sandwiches from Ferdinand's Creamery in Pullman.

On Thursday, June 13, the Lind Dryland Research Station will hold a field day to provide growers and other interested persons the opportunity to see what tests and experiments have been performed there.

06/07/2013



2013 seed yields. Winter canola seed yield ranged from 3014 to 3276 lbs/acre in 2013 with no statistical (P=0.40) differences among the residue management treatments.


Effect of Residue Treatments on Emergence and Damping-0ff of Canola, Schibel Plot, Spring, 2013
Percent
90
80
70
60
50
40
30
20
10
0
Percent emergence
Percent damping off
burned and disked
chopped and moldboard plow
direct seed standing stubble
burned and direct seeded
Treatments

A new (fifth) residue management treatment was added to the experiment beginning in the 2014 crop year. Winter canola seed was broadcast into the standing winter wheat crop before wheat harvest. Following wheat harvest, five inches of irrigation water was applied resulting in a thick stand of winter canola. Volunteer wheat was controlled with an application of Assure II grass weed herbicide.

Burned- Disked

Nov. 11, 2013

Chopped- Plowed

Nov. 11, 2013

Nov. 11, 2013

Direct Seeded

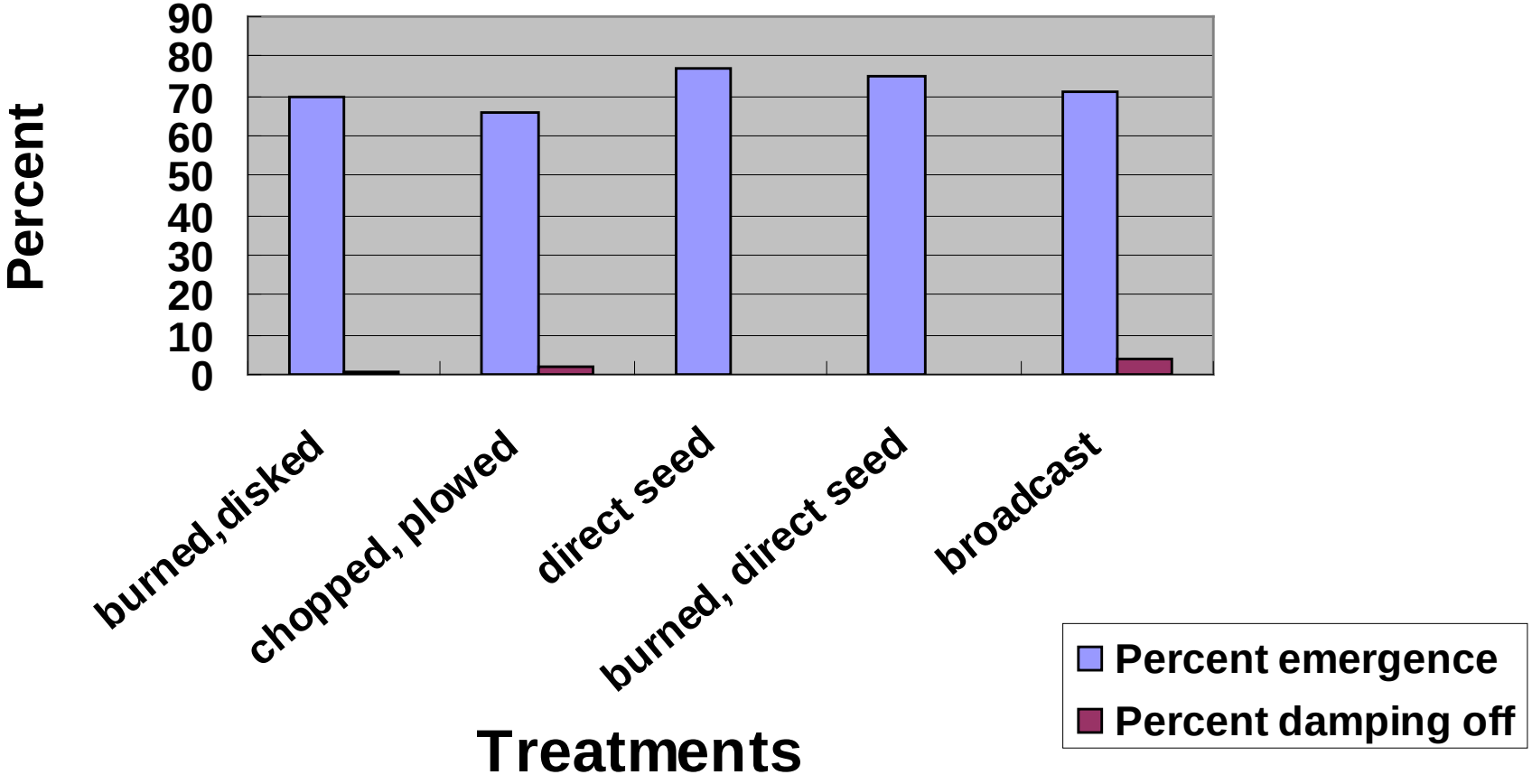
Nov. 11, 2013

Burn-Direct Seeded

Broadcast before wheat harvest

Nov. 11, 2013

Effect of Residue Treatments on Emergence and Damping-0ff of Canola, Schibel Plot, Sampled Oct. 2013

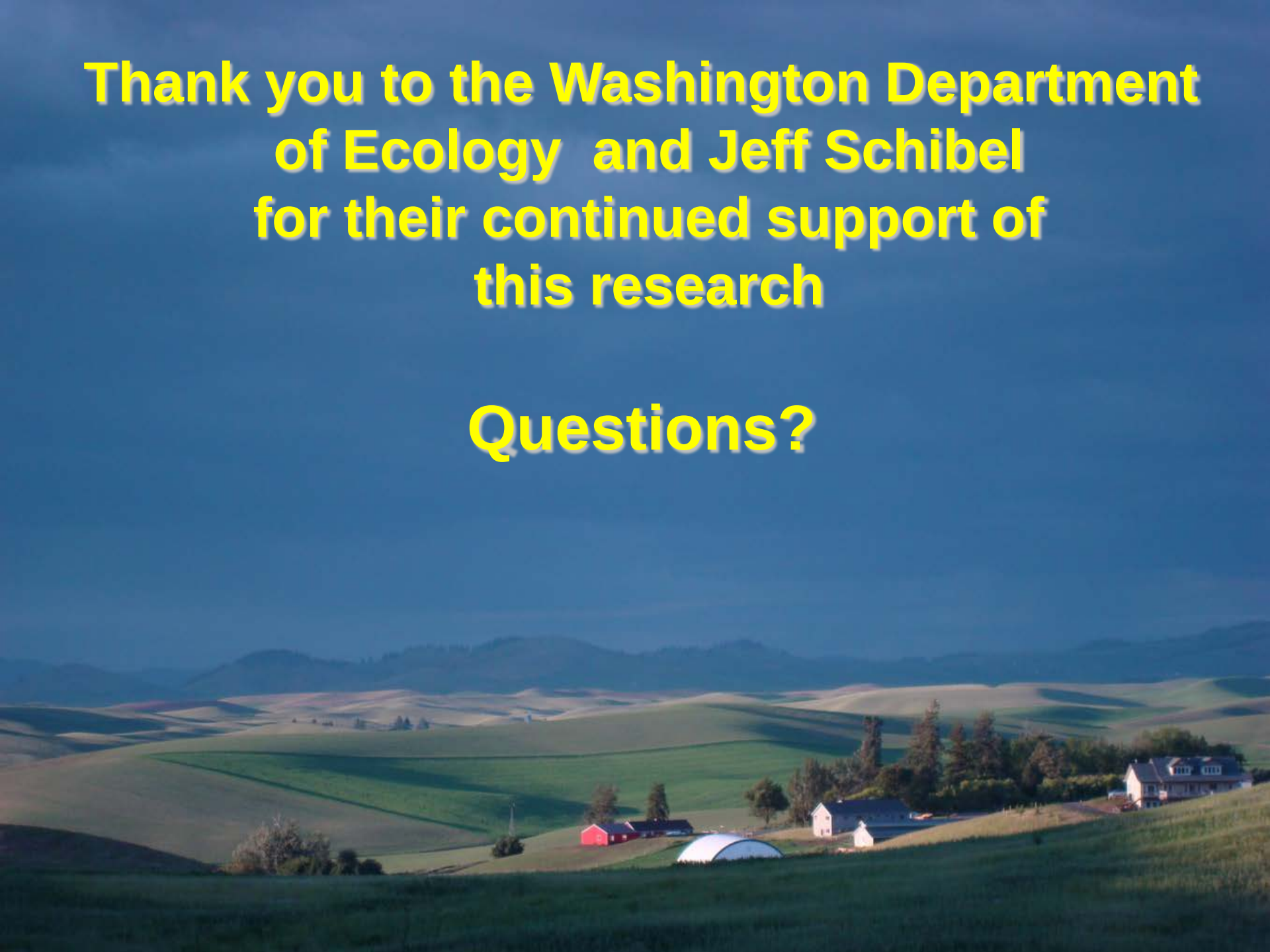


Disease Conclusions

- Good emergence in bioassays, no effect of residue treatment or tillage
- Very low level of *Rhizoctonia solani* AG 2-1 in bioassay, no effect of residue treatment or tillage
- Does rotation with potatoes and fumigation with Vapam every few years reduce this pathogen?

Harsh winter of 2013-2014. Broadcast treatment. Photo by Jeff Schibel.

Harsh winter of 2013-2014. Burn + disk treatment. Photo by Jeff Schibel.


Thank you to the Washington Department of Ecology and Jeff Schibel for their continued support of this research
Questions?