

Forage Termination

- The Risk of Seeding Wheat versus Canola



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Forage Termination Strategies

Western Canada Recommendations

- Tillage (five to seven passes)
 - Soil erosion, degradation (om, soil structure), loss of soil moisture, time consuming, fuel and equipment costs
 - Abundant stones or uneven topography many favour herbicide use over tillage. Tillage might be needed to even out mole hills.
 - Not effective on alfalfa, smooth brome, quackgrass and Canada thistle
 - Losing a year of production
- Tillage and Herbicides
 - Substituting herbicide for tillage
 - Herbicide Timing
 - In summer or fall of the year prior to seeding
 - Prior to working stand in spring “When applying herbicides in early spring, control of perennial forages will be reduced as this is not the ideal stage for maximum effectiveness.”

Forage Termination Strategies

Western Canada Recommendations

- **Herbicides (glyphosate)**
 - Direct seed into undisturbed sod
 - Maintains soil aggregation, Moisture conservation and reduced soil erosion
 - Requires a disk or narrow knife seeding tool
 - Timing
 - In summer (July to September)
 - preharvest or regrowth (0.67 – 1.33 l/ac Transorb)
 - Potential for incomplete kill. If preharvest is applied to first cut hay, then a preseeding application will more likely be warranted later in the growing season or following spring
 - Mellow seed bed, more time for sod to decompose, less phytotoxicity, less soil borne disease
 - Soil nitrogen and moisture levels have more time to build up
 - In fall (Late August to September)
 - preharvest or regrowth (0.67 – 1.33 l/ac Transorb)
 - Potential of a second (or third) hay cut in final year
 - Best results in early September on hay not cut since mid July, however, dry fall conditions could reduce control (brown soil zones)
 - Air temperatures below 15°C may reduce glyphosate efficacy at rates below 0.67 l/ac

Forage Termination Strategies

Western Canada Recommendations

- Herbicides (glyphosate)
 - Timing
 - In spring
 - must delay seeding (2-3 weeks) to wait for regrowth (3-4 leaf stage) before spraying (0.67 – 1.33 l/ac Transorb)
 - May not work as well
 - Uses up spring moisture
 - Later release of nitrogen from terminated stand
 - Seed bed not as mellow

Forage Termination Strategies

Sask Ag. Recommendation

Crop Selection

- Sod seeding with cereal crops (eg. wheat, barley and oats) provide more consistent results than with small seeded crops such as canola.
- The larger seed size of cereals allows seeds to be placed beneath the thatch layer into soil where good soil to seed contact occurs.
- If seeding late a silage or green feed crop might be a better option
- Root rot and other soil-borne diseases with a heavy sod may affect barley, wheat and peas

Treatments for RR canola and wheat*



#	Timing	Rate (L/ac Transorb)
1	Preharvest –Aug 8, 2014	0.66 – Direct seeded May 25, 2015
2	Early Spring – May 19, 2015	1.33– Direct seeded May 25, 2015
3	Early Spring – May 19, 2015	0.66– Direct seeded May 25, 2015
4	Early Spring – May 19, 2015	1.33- Cultivated then seeded May 25, 2015

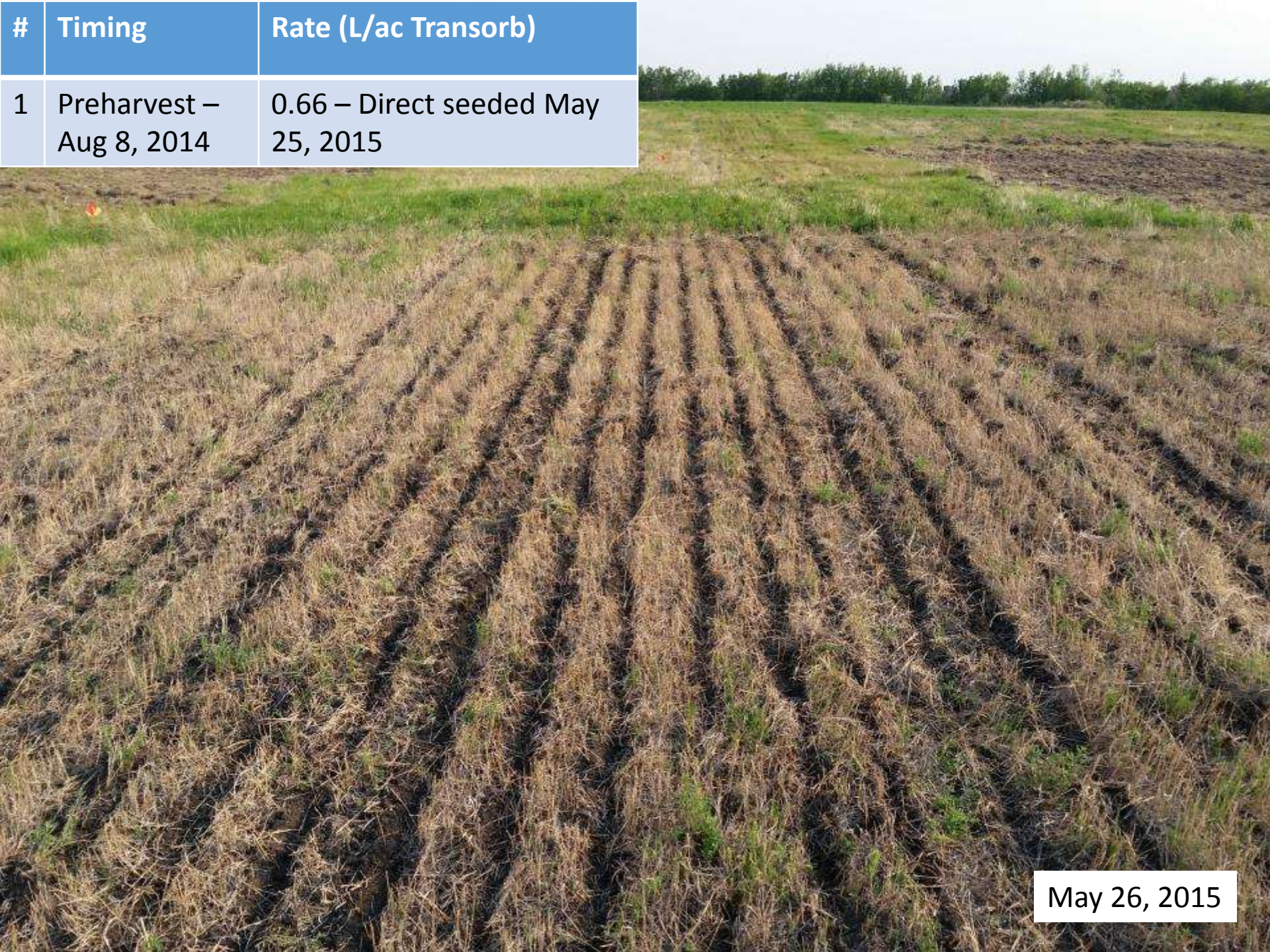
*2-RCBD's with 4 replicates; plot size 35 by 50 feet

#	Timing	Rate (L/ac Transorb)
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Harvested Sept 14, 2014
Picture Sept 23, 2014

#	Timing	Rate (L/ac Transorb)
1	Preharvest – Aug 8, 2014	0.66 – Direct seeded May 25, 2015



May 26, 2015

#	Timing	Rate (L/ac Transorb)
2	Early Spring – May 19, 2015	1.33– Direct seeded May 25, 2015
3	Early Spring – May 19, 2015	0.66– Direct seeded May 25, 2015



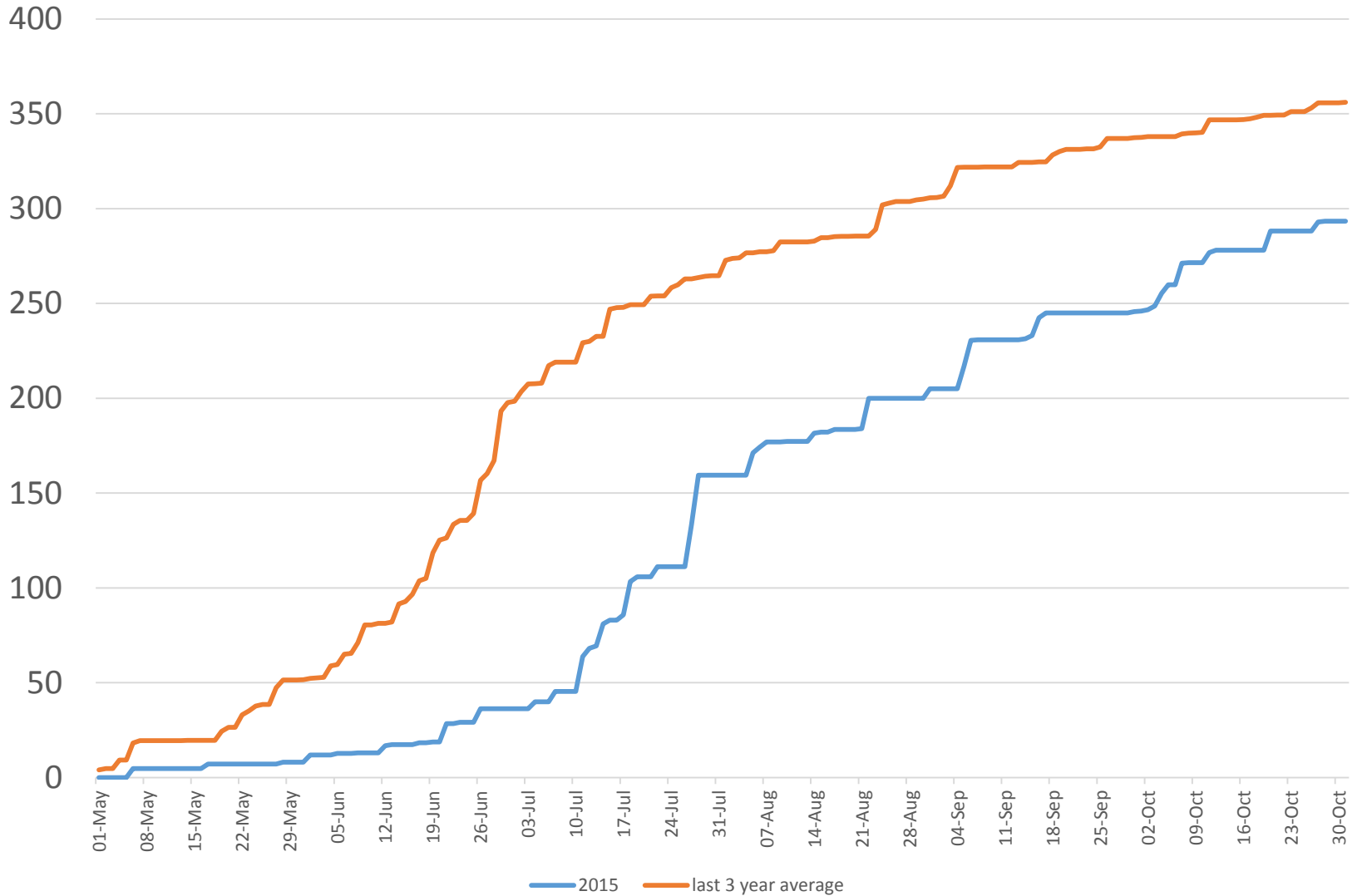
May 26, 2015

#	Timing	Rate (L/ac Transorb)
4	Early Spring – May 19, 2015	1.33- Cultivated then seeded May 25, 2015



May 26, 2015

Accumulated Rainfall (mm) Yorkton



Variable timing of
emergence



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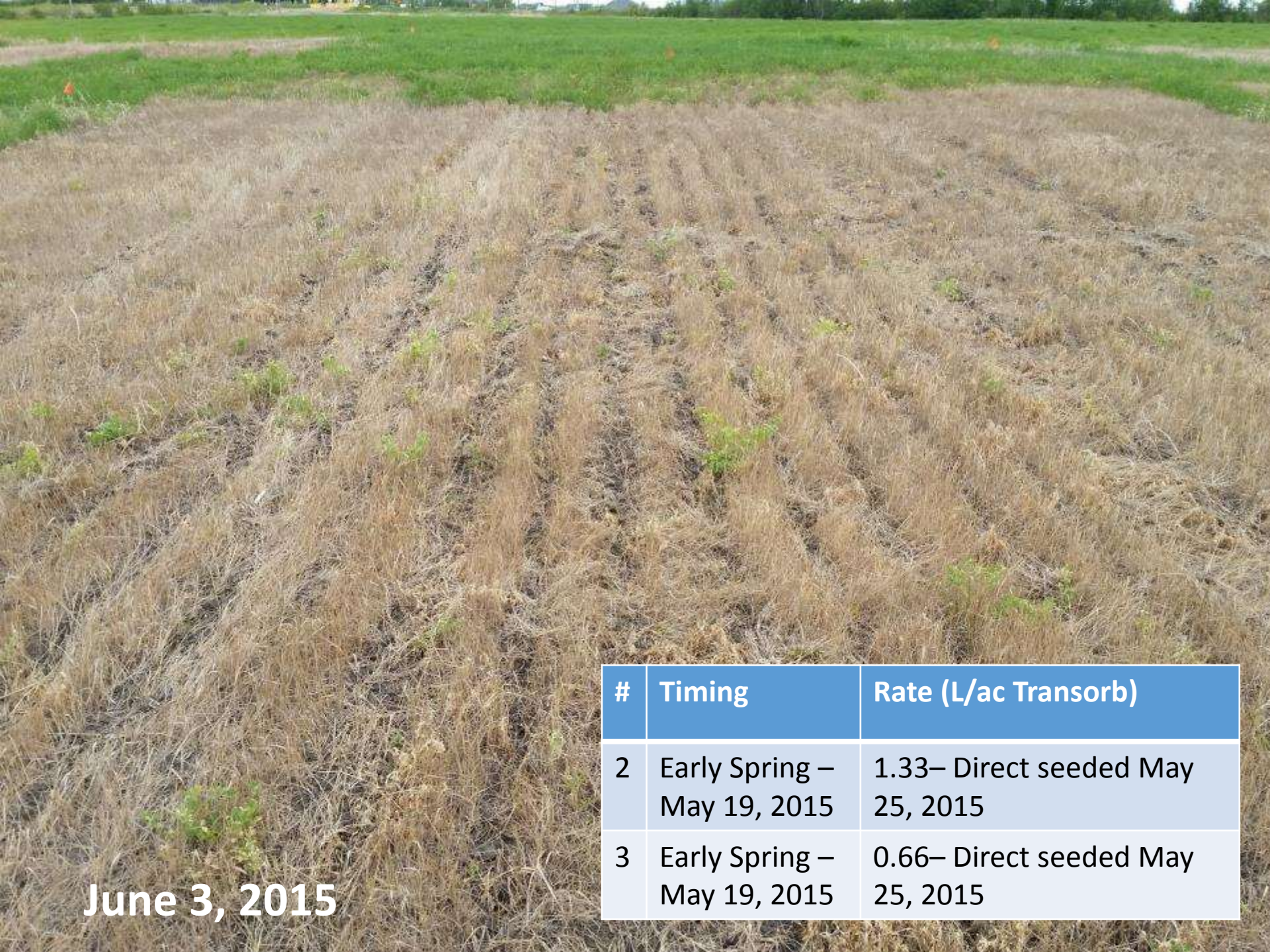


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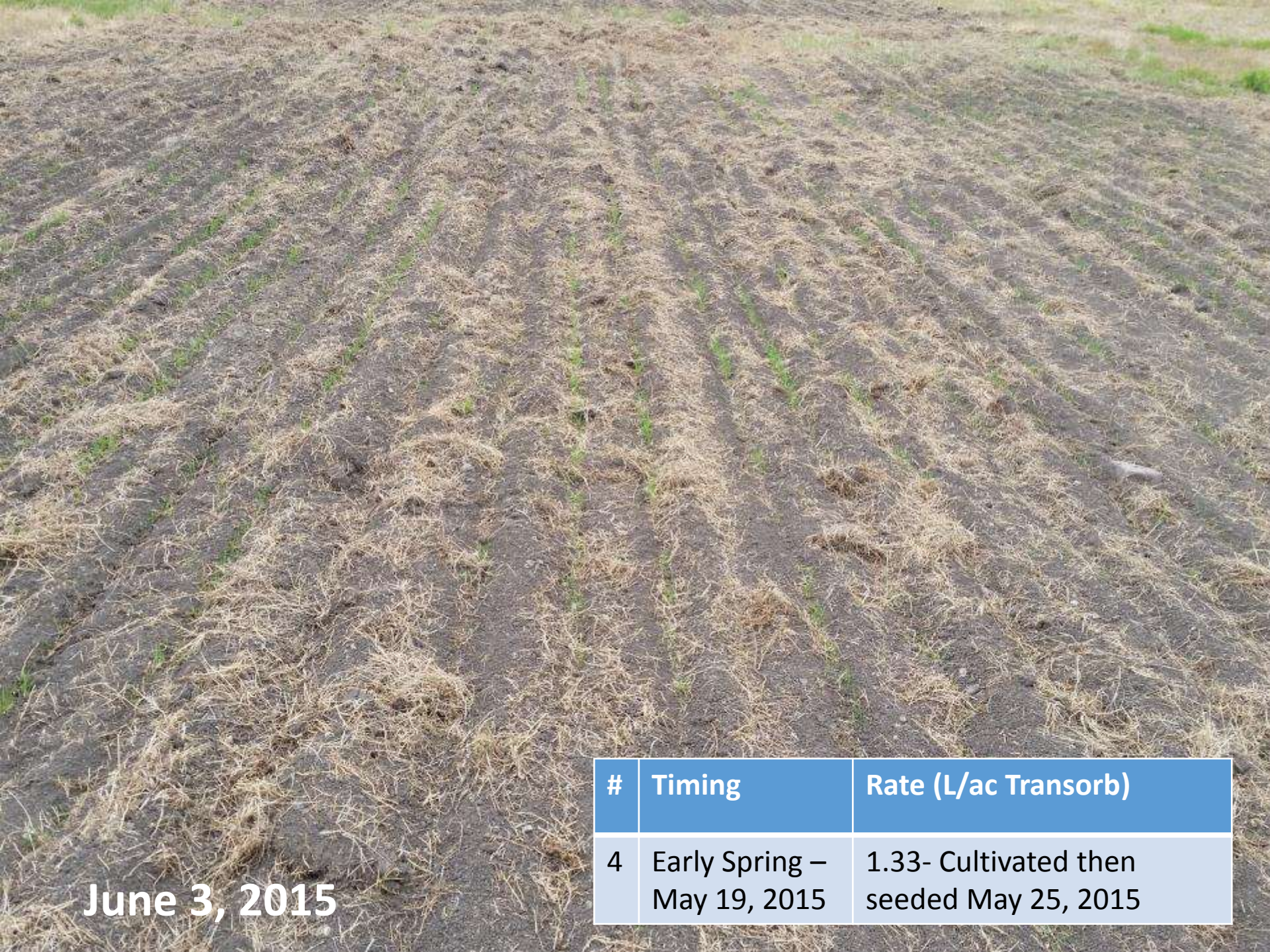
June 3, 2015

#	Timing	Rate (L/ac Transorb)
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Treat 2. Spring glyphosate 1.33 L/ac (Transorb)



Seeded May 25

June 18, 2015



Treat 1. Preharvest glyphosate 0.66 L/ac (Transorb)



Seeded May 25

June 18, 2015



Treat 4. Preharvest glyphosate 1.33 L/ac (Transorb); Cultivate



Seeded May 25

June 18, 2015

Treat #	Wheat Yield (bu/ac)
1	7.1 c
2	29.4 a
3	28.3 a
4	17.8 b



Harvest Oct 15

Treat #	Canola Yield (bu/ac)
1	47.8 a
2	33.9 c
3	36.4 c
4	43 b



Harvest Oct 11

#	Timing	Rate (L/ac Transorb)
1	Preharvest – Aug 8, 2014	0.66 – Direct seeded May 25, 2015

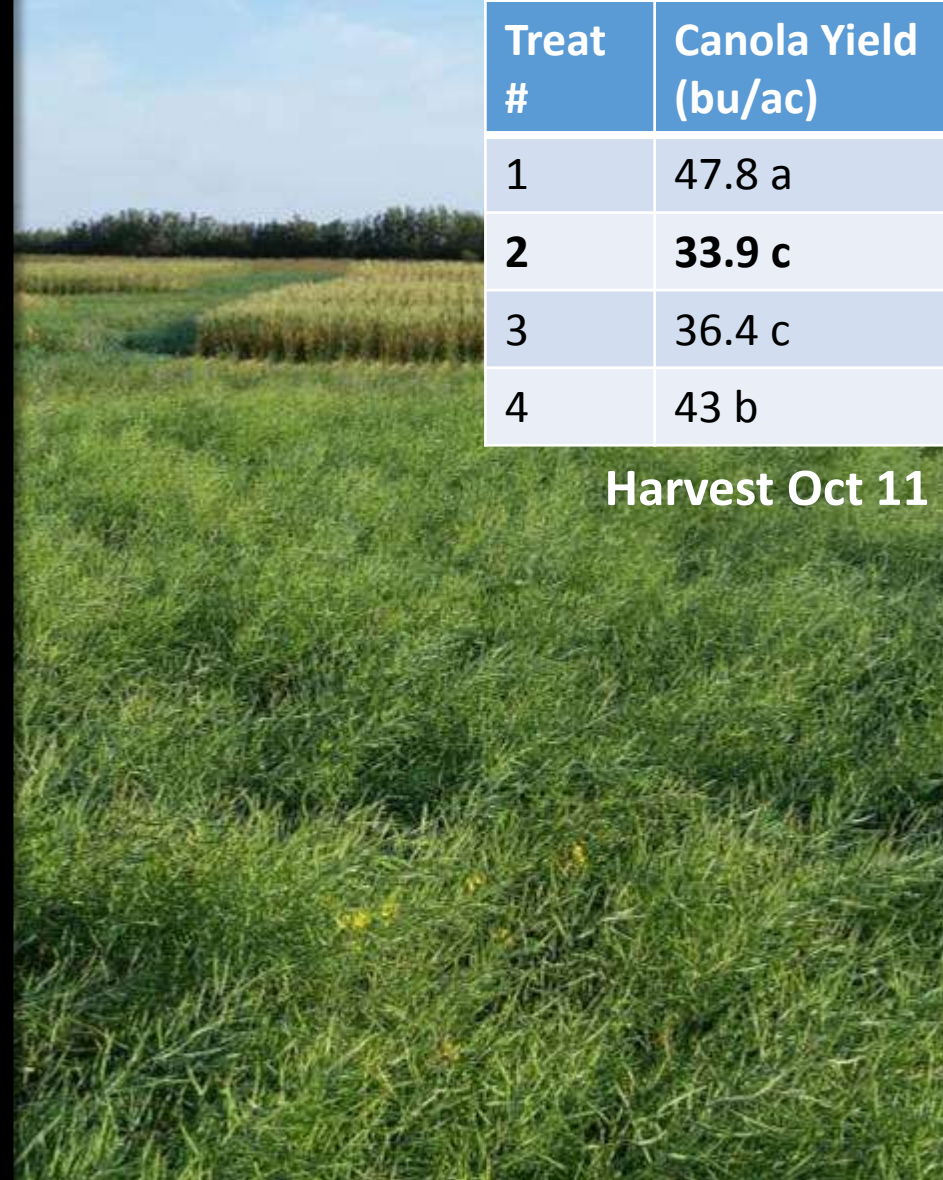
Sept 2, 2015

Treat #	Wheat Yield (bu/ac)
1	7.1 c
2	29.4 a
3	28.3 a
4	17.8 b



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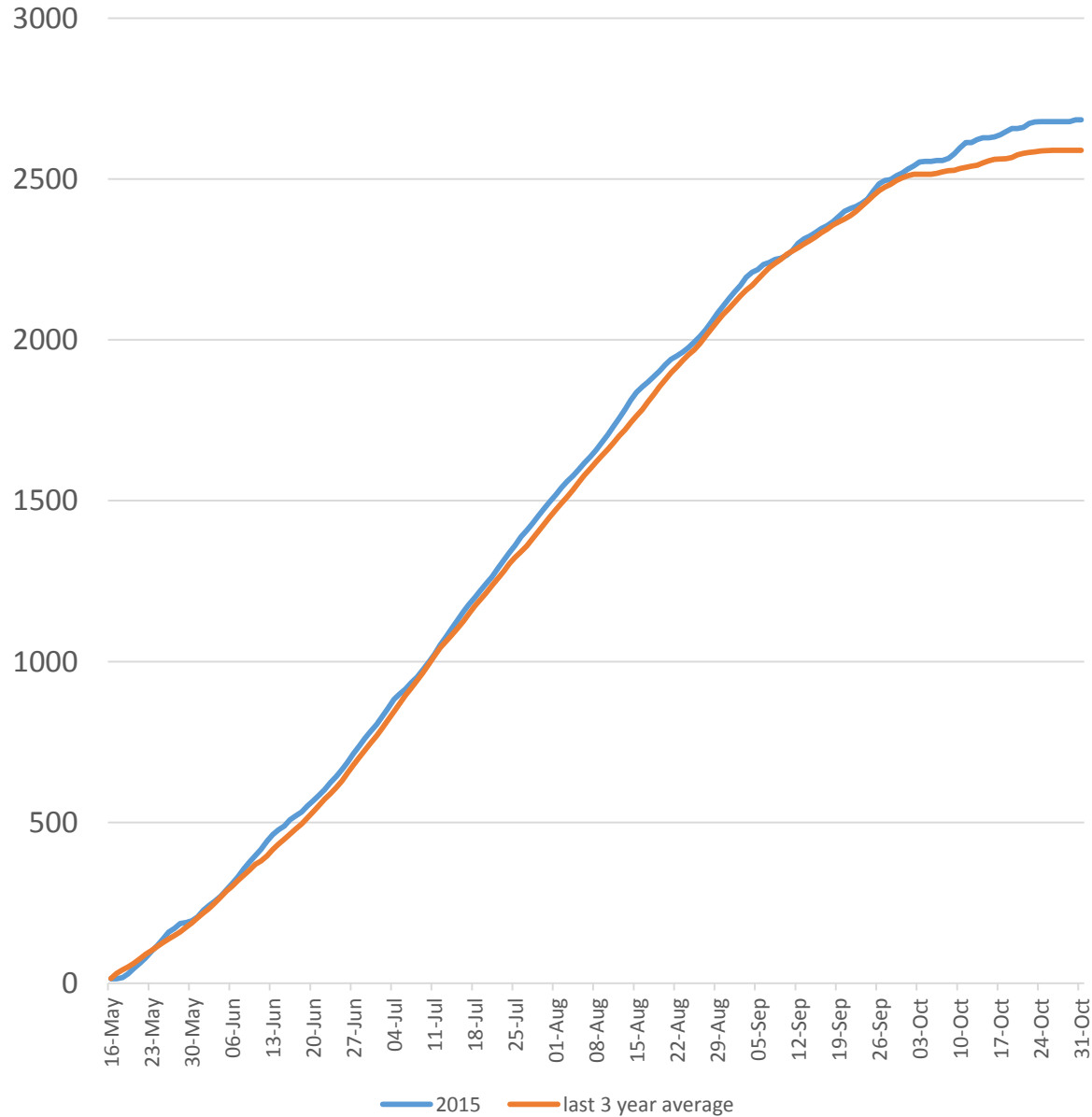


Harvest Oct 11

#	Timing	Rate (L/ac Transorb)
4	Early Spring – May 19, 2015	1.33- Cultivated then seeded May 25, 2015

Sept 2, 2015

Crop Heat Units Yorkton



Summary and Conclusions

- Preharvest glyphosate (0.66 l/ac Transorb on Aug 8) produced the greatest canola yields
 - More soil moisture reserves
 - In crop glyphosate could control regrowth of Smooth brome
- Preharvest glyphosate (0.66 l/ac Transorb on Aug 8) produced the lowest wheat yields
 - Smooth brome emerged after seeding and couldn't be controlled in-crop
 - The incomplete control may have resulted from:
 - A mid date preharvest application
 - Relatively low glyphosate rate
- Spring glyphosate (0.66 or 1.33 l/ac Transorb on May 19) provided decent yields of canola and wheat
 - Emergence was very late (dry soil) thus maturity was late for both wheat and Canola. Narf had a similar situation but only the emergence of the canola was affected which reduced yield.
 - Other trials have found this timing can result in reduced control. Adequate forage regrowth in spring is crucial.
- Spring cultivation improved crop emergence with spring glyphosate
 - Improved canola yield relative to spring glyphosate treatments
 - Early emergence
 - Decreased wheat yield relative to spring glyphosate treatments
 - Early emergence too but maybe wheat less able to compensate for early drought or ?

Summary and Conclusions

If it were me?

- Spray out in the summer or fall before seeding
 - Avoid early august timing, early sept probably better
- Seed RR Canola
- If soil conditions real dry consider a cereal for grain or green feed

THE END



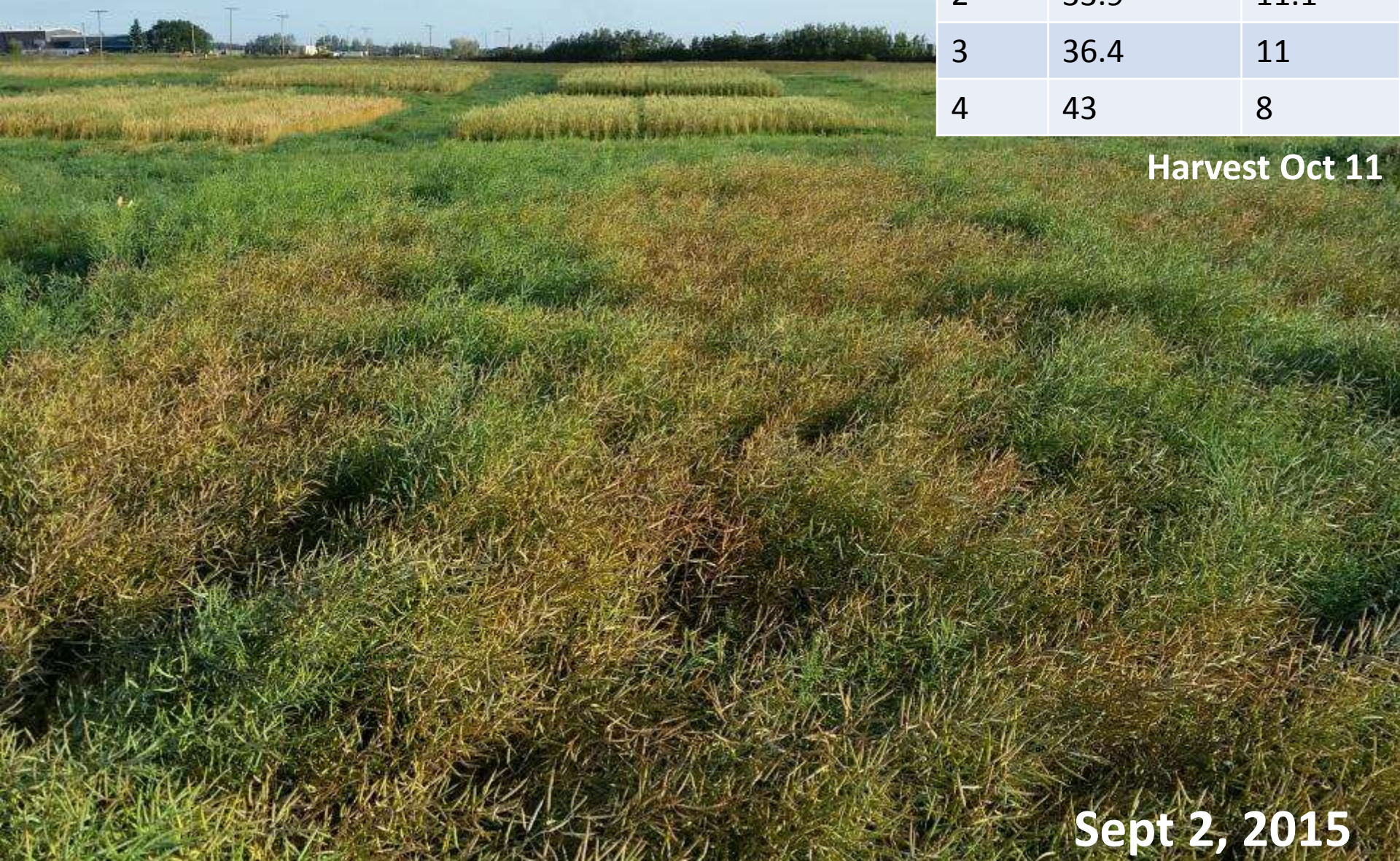
Direct Seeding of Annual Crops into Sod-NARF

Crop	Spray timing	Seeding method	Yield (bu/ac)
Canola	Spring only	Disc	16
Canola	Spring only	Knife	22
Canola	Fall and Spring	Disc	15
Canola	Fall and Spring	Knife	24
Wheat	Spring only	Disc	42
Wheat	Spring only	Knife	39
Wheat	Fall and Spring	Disc	46
Wheat	Fall and Spring	Knife	53

- Fall weather max 2 l/ac
- Spring weather max 2 L/ac – May 18 (very little green-up of the fall sprayed sod prior to seeding)
- Visually weed control better with fall and spring
- Knife opener better than the disc
- Canola seeded May 30
- Fertility looks goofy sulphur wasn't applied on the canola until July 26 as a broadcast
- They had a dry spring also
- Canola emergence delayed and yields poor. Seeded shallower into dry soil than the wheat

#	Timing	Rate (L/ac Transorb)
1	Preharvest – Aug 8, 2014	0.66 – Direct seeded May 25, 2015

Treat #	Yield (bu/ac)	% moisture
1	47.8	9.6
2	33.9	11.1
3	36.4	11
4	43	8



Harvest Oct 11

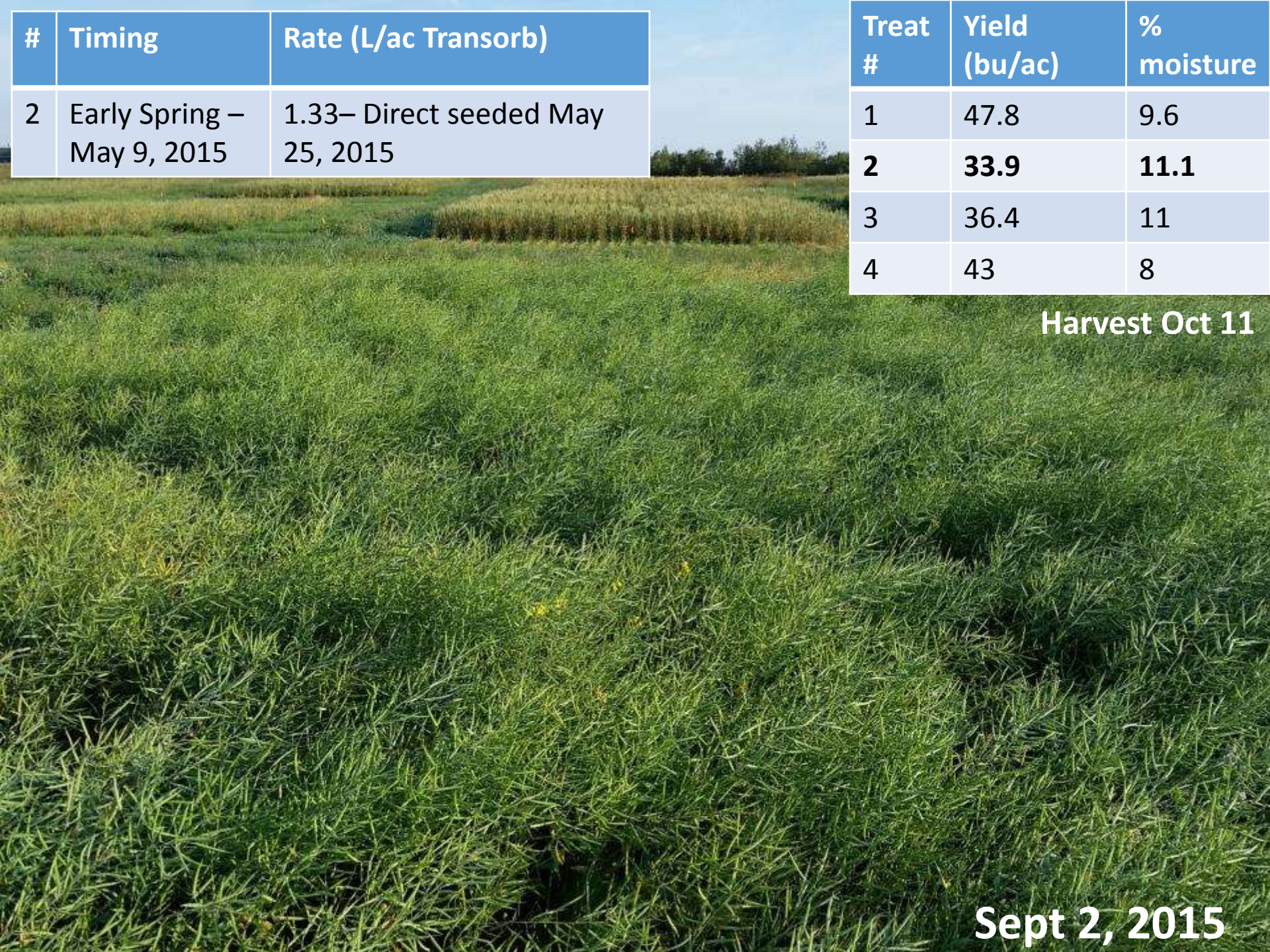
Sept 2, 2015

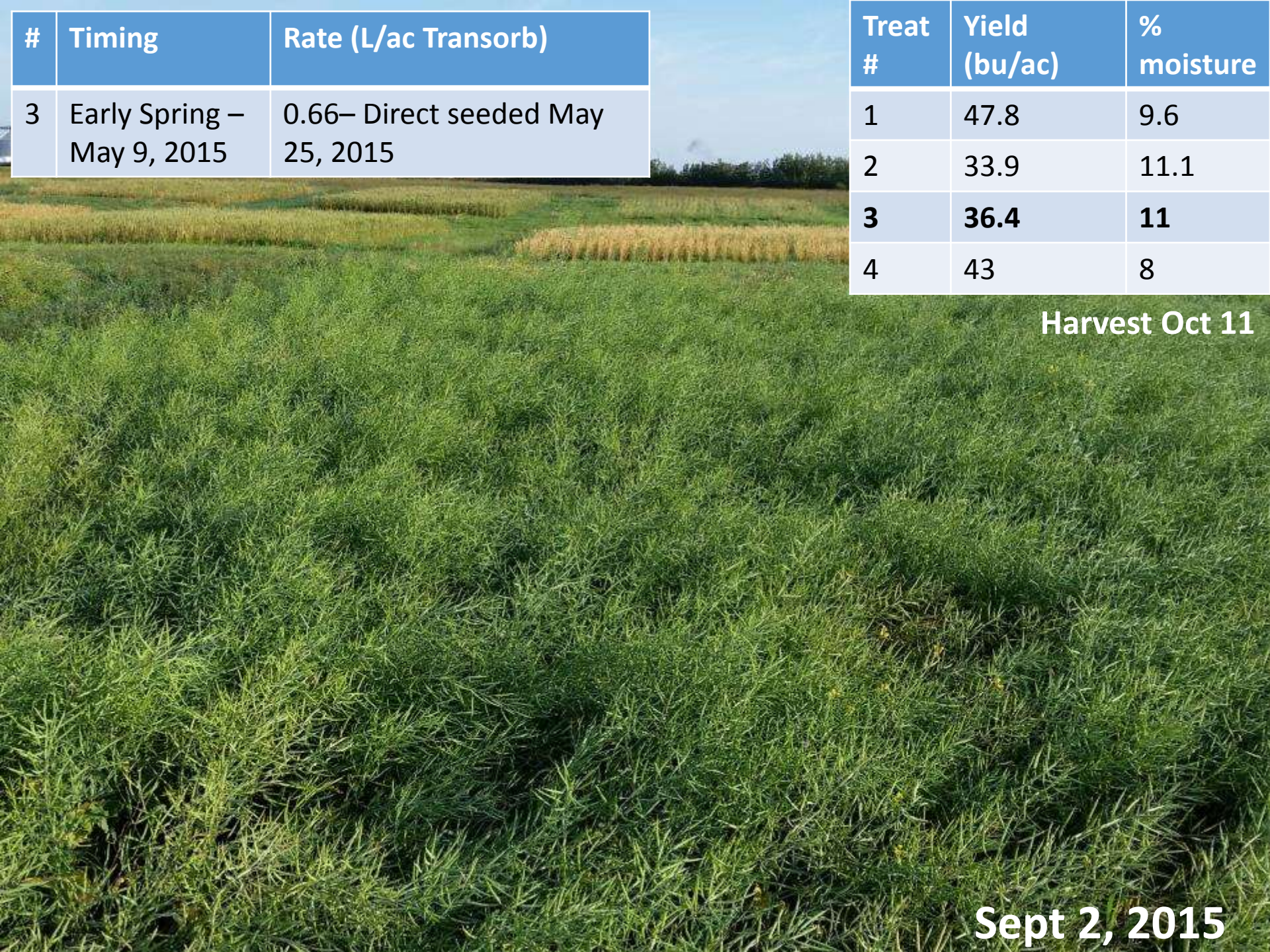
#	Timing	Rate (L/ac Transorb)
2	Early Spring – May 9, 2015	1.33– Direct seeded May 25, 2015

Treat #	Yield (bu/ac)	% moisture
1	47.8	9.6
2	33.9	11.1
3	36.4	11
4	43	8

Harvest Oct 11

Sept 2, 2015





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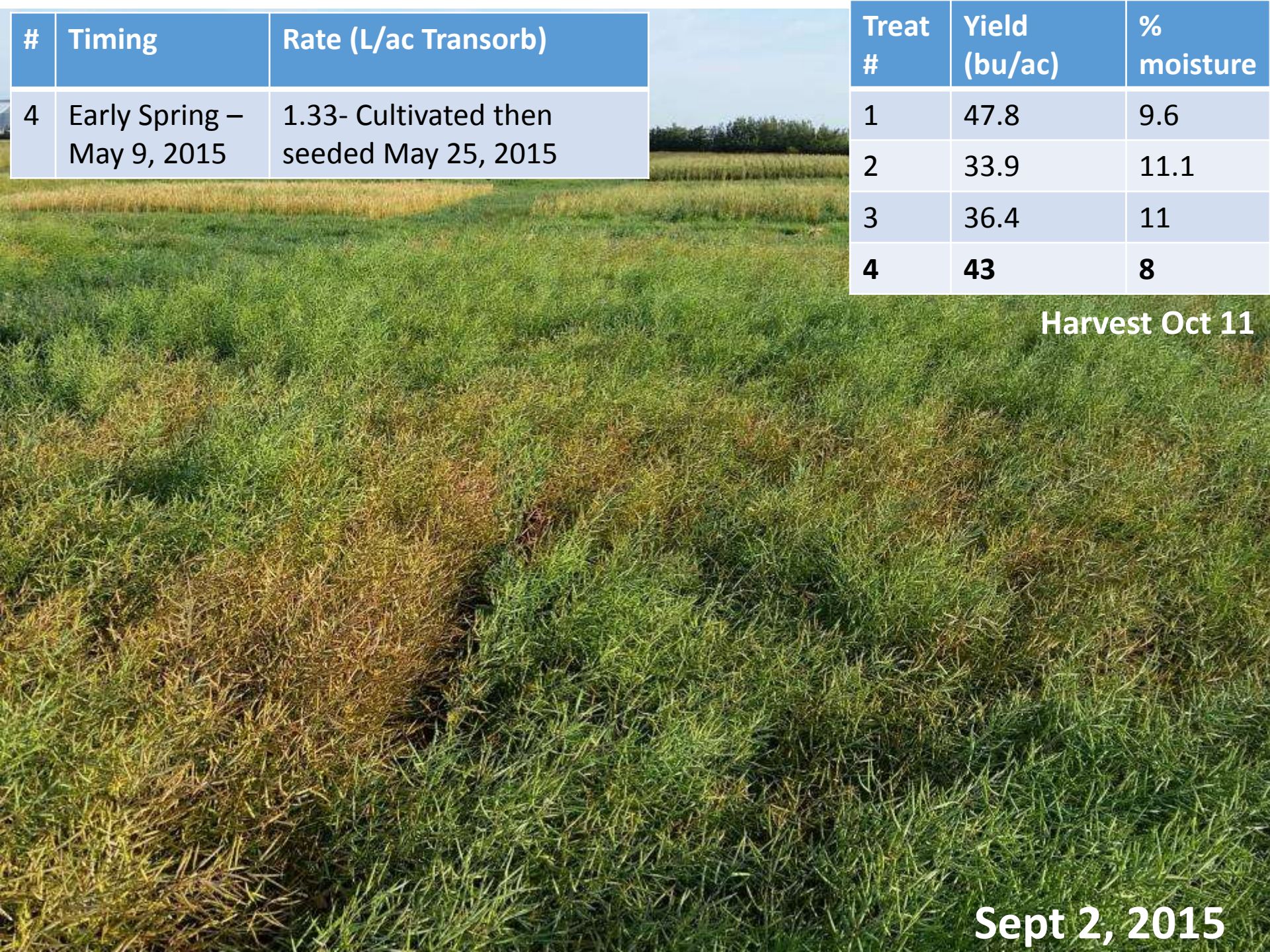
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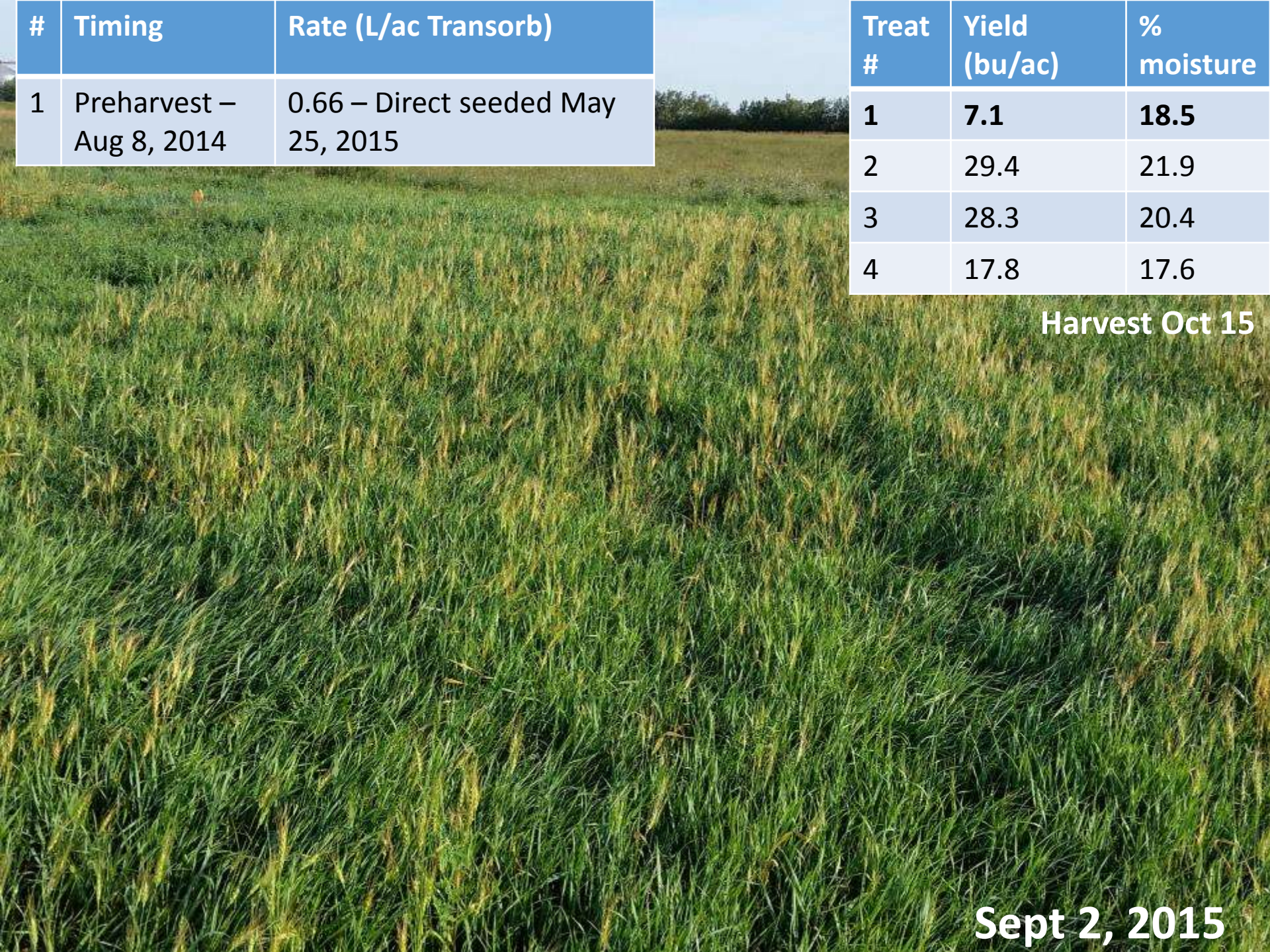
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Harvest Oct 11

Sept 2, 2015





#	Timing	Rate (L/ac Transorb)
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Treat #	Yield (bu/ac)	% moisture
1	7.1	18.5
2	29.4	21.9
3	28.3	20.4
4	17.8	17.6

Harvest Oct 15

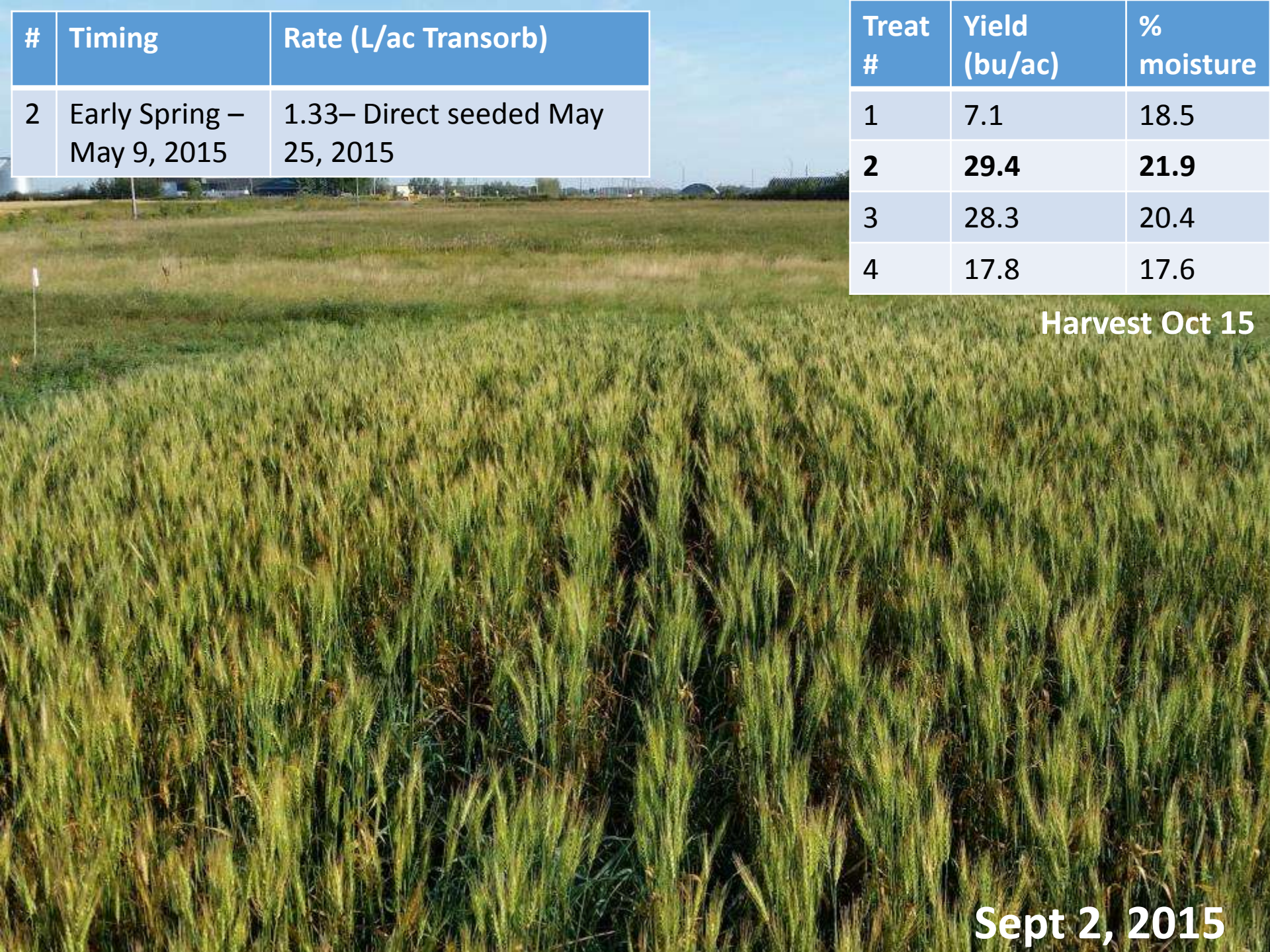
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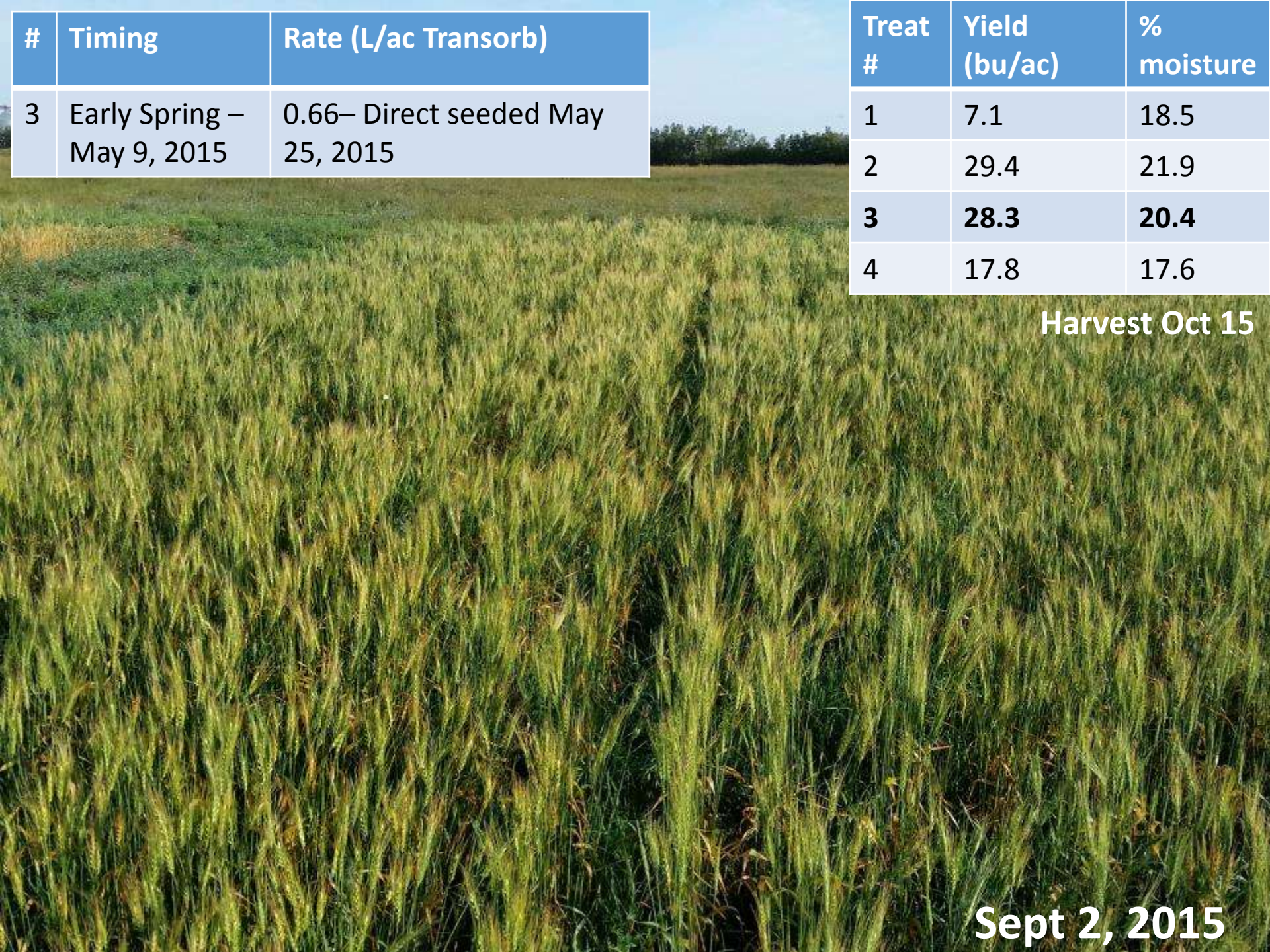
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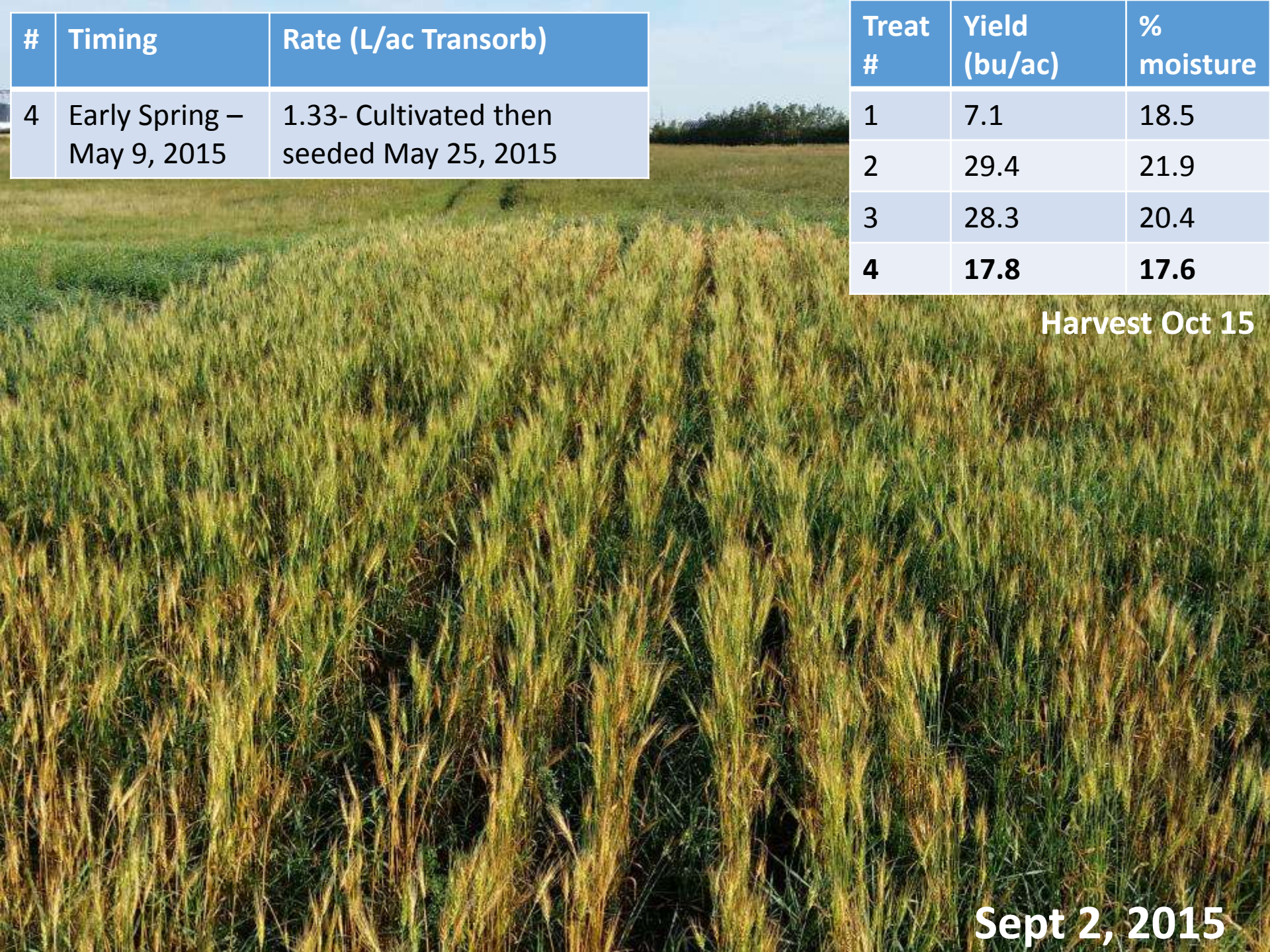


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Harvest Oct 15

Sept 2, 2015

Operation	Date
Preharvest glyphosate (Transorb 666 ml/ac) sprayed on trt 1 (both trials)	August 8, 2014
Forage cut from all treatments (both trials)	Sept 14, 2014
Glyphosate sprayed on treatments 2, 3 and 4 (both trials)	May 19, 2015
Cultivated treatment 4 (both trials)	May 23, 2015
Harrowed treatment 4 (both trials)	May 25, 2015
Seeded Canola and Wheat trials	May 25, 2015
Canola in trt 1 sprayed in-crop with glyphosate (400 ml/ac Transorb)	June 10, 2015
Wheat in trt 1 sprayed in-crop with Puma + Prestige	June 11, 2015
Canola in trt 1-4 sprayed in crop with 333 ml/ac Transorb	June 18, 2015
Wheat in trt 1 sprayed with simplicity; Wheat in trt 2-4 sprayed with simplicity + curtail M	June 25, 2015
Preharvest (666 ml/ac Transorb)	Oct. 1, 2015
Harvested Canola Trial	Oct 11, 2015
Harvested Wheat Trial	Oct 15, 2015



May 26, 2015



June 3, 2015



Sept 2, 2015



Sept 2, 2015

Treat 2. Spring glyphosate 1.33 L/ac (Transorb)



Seeded May 25

June 18, 2015

Treat 1. Preharvest glyphosate 0.66 L/ac (Transorb)



Seeded May 25

June 18, 2015

Treat 4. Preharvest glyphosate 1.33 L/ac (Transorb); Cultivate



Seeded May 25

June 18, 2015

Forage Termination Strategies on Succeeding Annual Crops

Wheatlands Conservation Association

1. Forage (terminated by Full Tillage) – pea –Wheat
2. Forage (terminated by Full Tillage) – oat –Wheat
3. Forage (terminated by Full Tillage) – canola –Wheat
4. Forage (terminated by Full Tillage) – wheat –Wheat
5. Forage (terminated by Full Tillage) – Full Tillage fallow-Wheat
6. Forage (terminated by Chemical Tillage) – pea –Wheat
7. Forage (terminated by Chemical Tillage) – oat –Wheat
8. Forage (terminated by Chemical Tillage) – canola –Wheat
9. Forage (terminated by Chemical Tillage) – wheat –Wheat
10. Forage (terminated by Chemical Tillage) – Chemical fallow-Wheat
11. Forage (terminated by Min Tillage) – pea –Wheat
12. Forage (terminated by Min Tillage) – oat –Wheat
13. Forage (terminated by Min Tillage) – canola –Wheat
14. Forage (terminated by Min Tillage) – wheat –Wheat
15. Forage (terminated by Min Tillage) – Min Tillage fallow-Wheat

Full Tillage System

In 2013

- May 2 Tandem disked (3 times)
- May 27 Seeded annual crop (80N cereals, 100N canola 50P peas)
- Aug 8 Tandems disked (additional demo plot)
- Harvest

In 2014

- June 2 Tandem disked
- June 5 Seeded Unity 70N 35P 0K 14S side banded
- June 24 Sprayed in-crop with Horizon and Thumper

Min Tillage System

In 2013

- May 2 Tandem disked (1 times)
- May 7 Roundup Transorb @ 1 l/ac
- May 21 Roundup Transorb @ 1 l/ac
- May 27 Seeded annual crop (80N cereals, 100N canola 50P peas)
- Harvest

In 2014

- June 2 Roundup Transorb @ 1 l/ac
- June 2 Tandem disked
- June 5 Seeded Unity 70N 35P 0K 14S side banded
- June 24 Sprayed in-crop with Horizon and Thumper

Chemical Termination system

In 2013

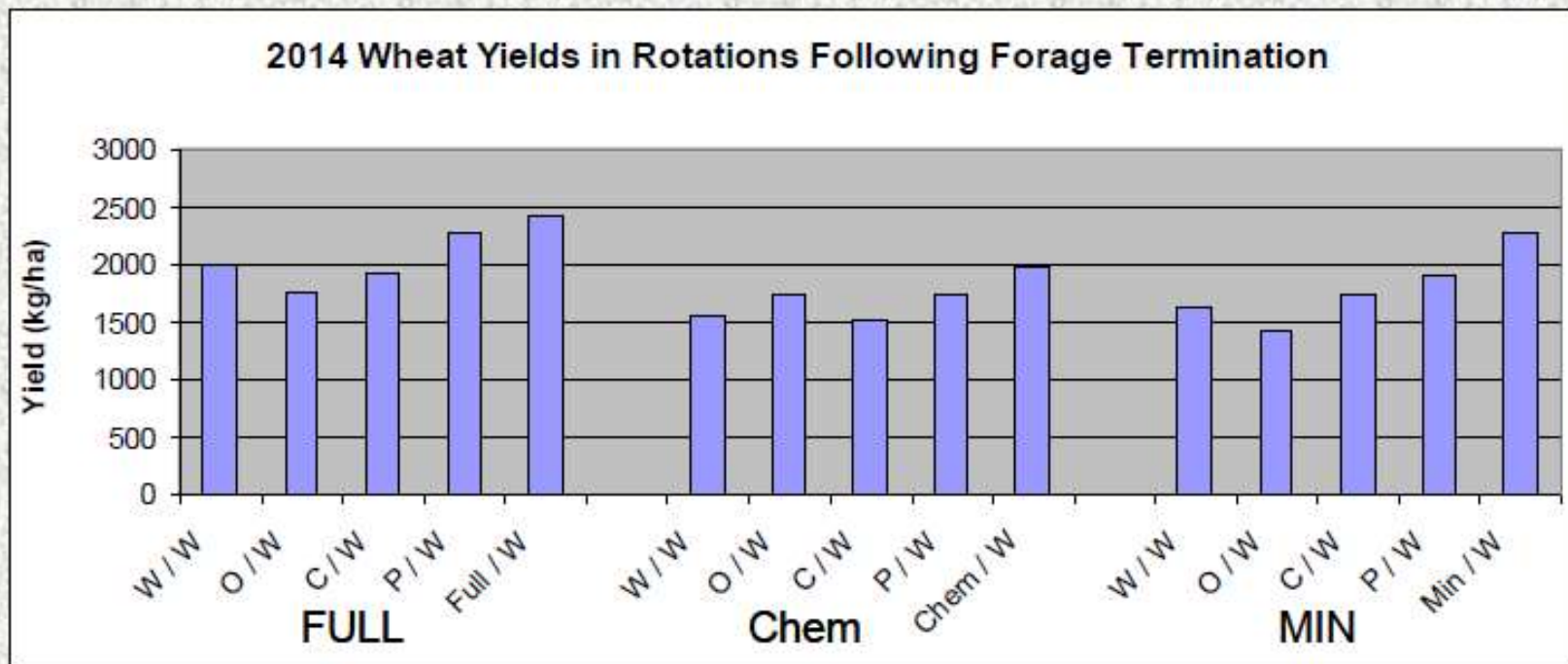
- May 7 Roundup Transorb @ 1 l/ac
- May 21 Roundup Transorb @ 1 l/ac
- May 27 Seeded annual crop (80N cereals, 100N canola 50P peas)
- Aug 8 Roundup Transorb @ 1l/ca + Heat (additional demo plot)
- Harvest

In 2014

- June 2 Roundup Transorb @ 1 l/ac
- June 5 Seeded Unity 70N 35P 0K 14S side banded
- June 24 Sprayed in-crop with Horizon and Thumper



2014 Wheat Yields Following Forage Termination



- Wheat yields were best following forage termination in the year prior to seeding an annual crop, despite the method of termination.
- Crops grown in the same year of forage termination suffered from poor seedbed preparation and abundant forage re-growth despite in-crop herbicides competing with the crop in 2013, which carried over into 2014.
- Abundant rainfall in 2014 eliminated the negative affects of tillage.