Faba Bean Agronomy

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Agronomy & Seed Manager

Dec 15– Webinar

SASKATCHEWAN pulse Growers

Topics to Cover

Å Why faba beans

Å Agronomics

Å 2015 Experience

Source: S. Phelps, SPG 2015

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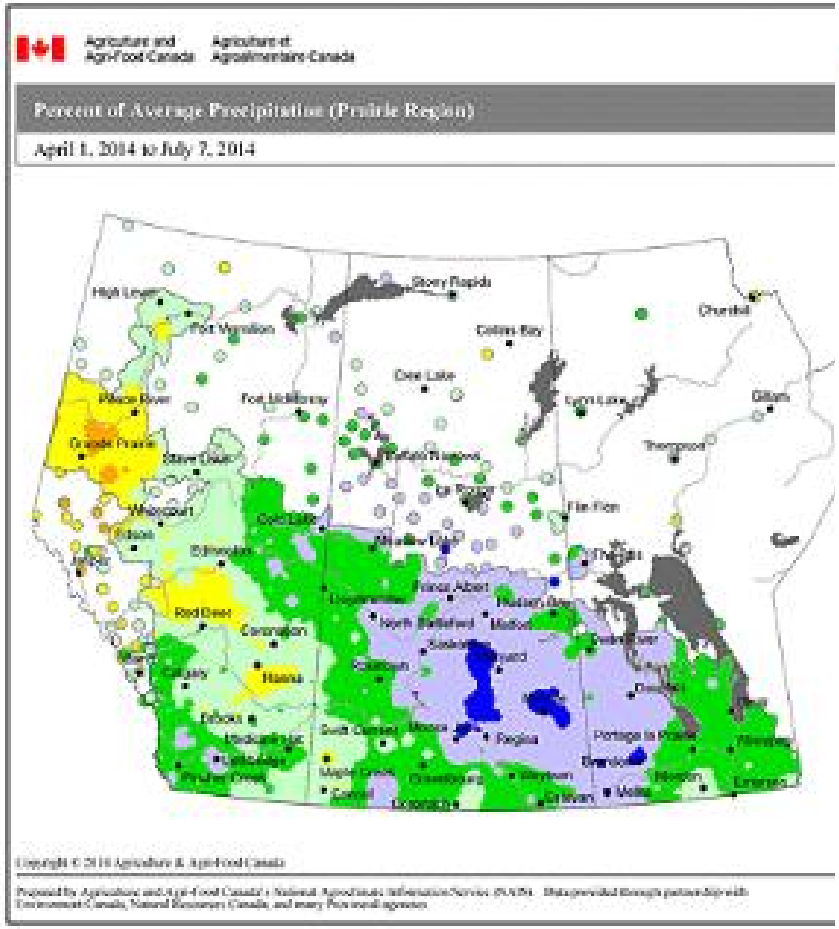
Interest in faba beans

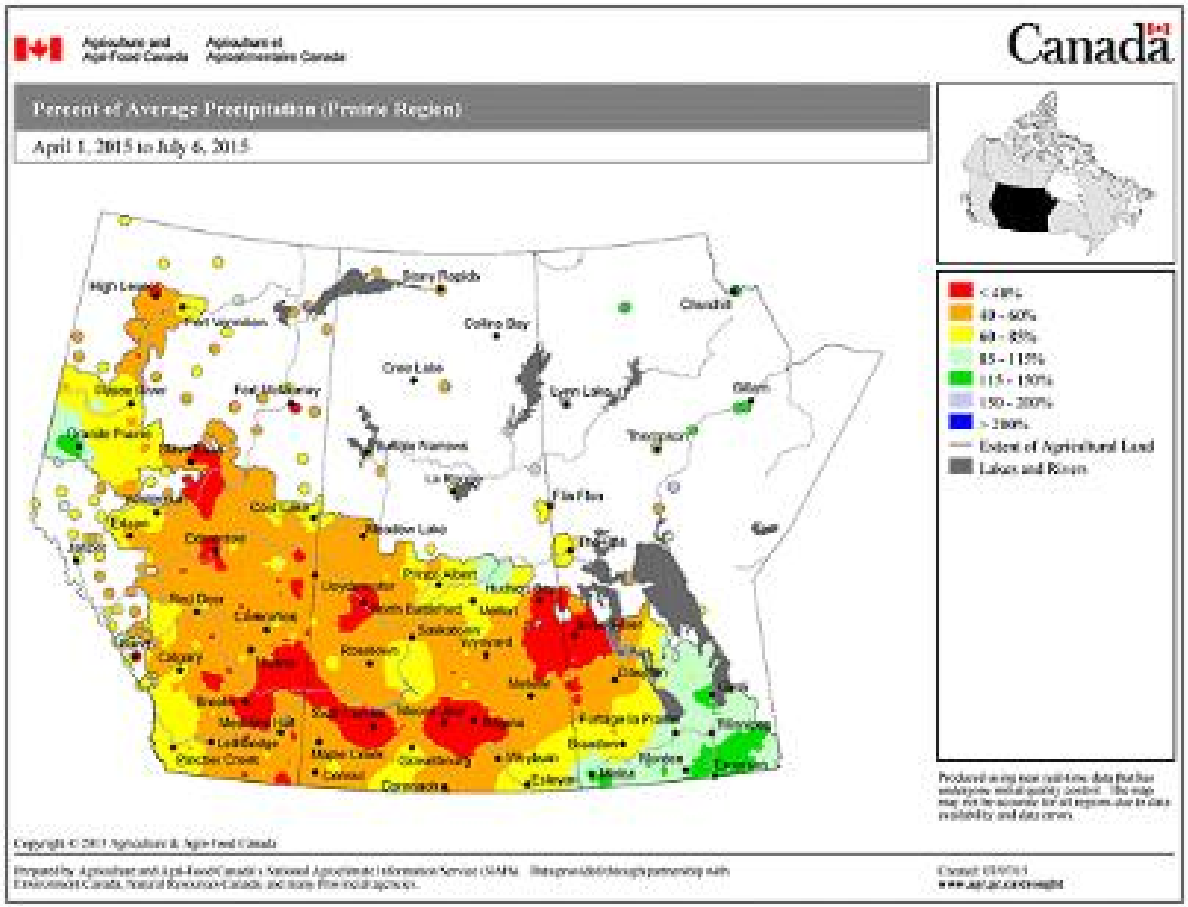
Acreage in Western Canada ï Crop Insurance Acreage

Year	AB	SK	MB	Total
2014	80,000	20,000		100,000
2015	110,000	61,792	9,040	>180,000
2016	???	???	???	???

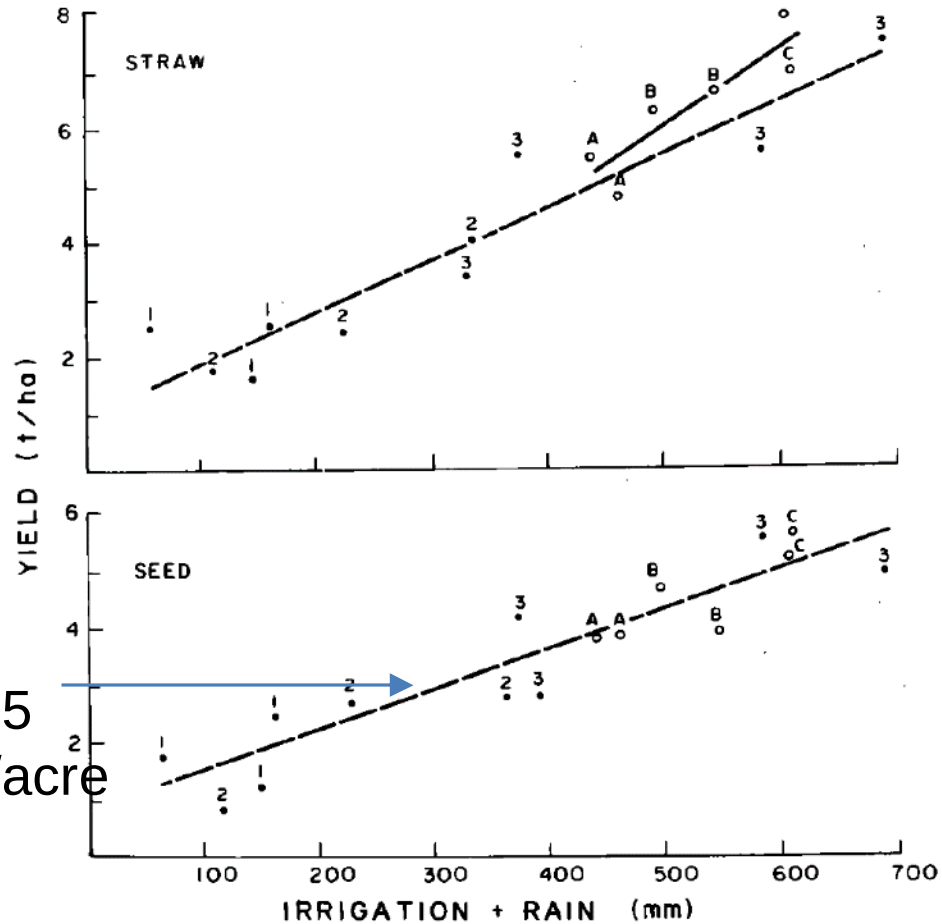
Why interest in faba bean?

1. Wet years/springs – still want a pulse





Water Response of Faba Bean



44.5 bu/acre

300 mm moisture

Alberta Agriculture

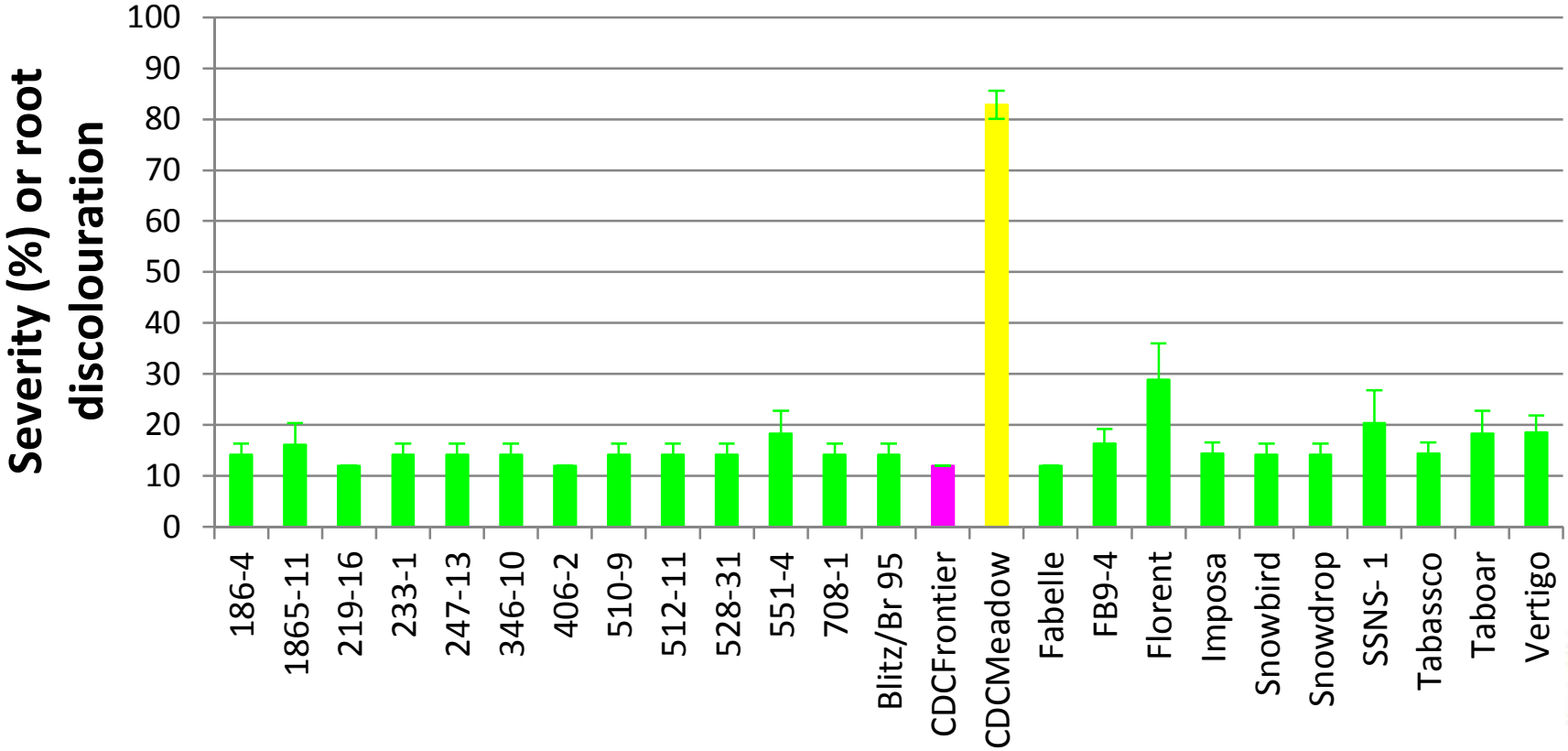
(1974-77, Vauxhall and Brooks)

For full yield potential need lots of moisture!!

- 8-10 inches suggested
- Spring soil moisture + rainfall or **irrigation**

2. Aphanomyces Root Rot

- **Faba beans** varieties have more tolerance than **pea** but similar to chickpea



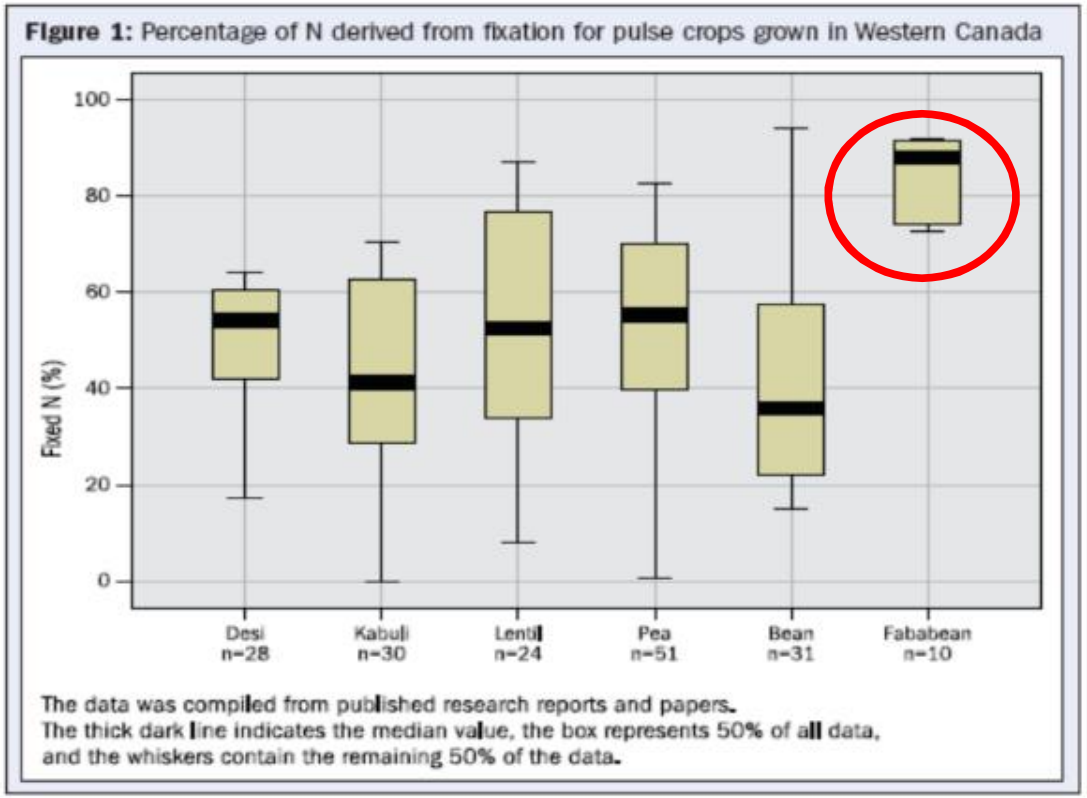
3. Standability is good

Faba beans

Peas

Photo: S. Phelps, SPG from Medstead, September 2015

4. Nitrogen Fixation Potential



Faba bean are the highest N-fixing legume grain crop

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N fixed in Western Canada (dryland)

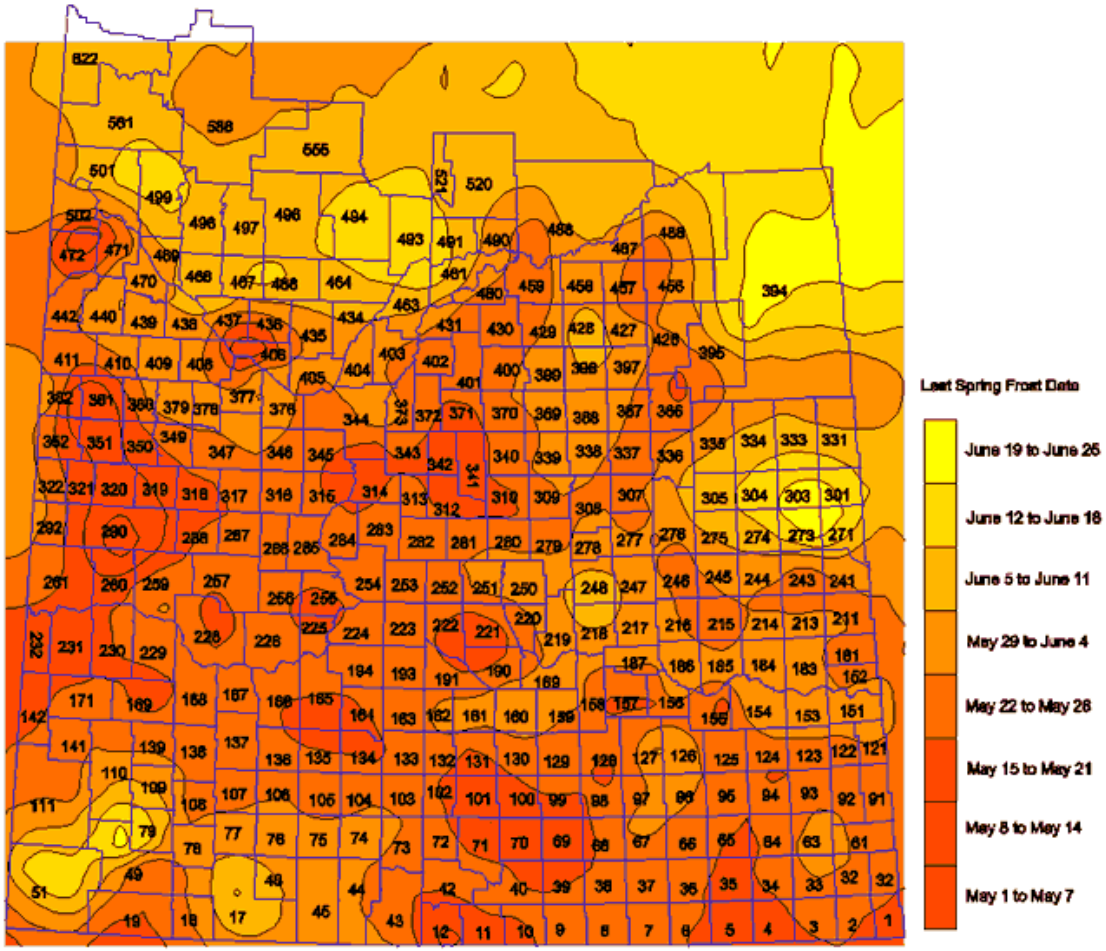
	lbs N / acre
Alfalfa	**100 - 250**
Pea	50 - 150
Lentil	30 - 120
Chickpea	20 - 100
Dry Bean	5 - 70
Faba Bean	**80- 160**

Source: Dr. J. Schoenau, U of Saskatchewan

Significant $ Value

Actual amount depends on inoculation/nodulation, environmental conditions, soil available N and other nutrients like P.

5. Tolerance to Spring Frosts



-Growing points below soil surface

-Seed early

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Agronomics of Faba Bean

Source: S. Phelps, SPG 2015

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Crop Maturity

Crop	Maturity (days)	Crop	Maturity (days)
Canola	88-100	**Fababean**	**105-109**
SWS wheat	105	Hemp	80-120
CPS wheat	101-103	Corn	120
HRS wheat	98-103	Soybean	119-124
Barley	91	Sunflower	108-119
Oat	96	Quinoa	90?-125 Colorado
Peas	86-94		
Flax	101	Camelina	90
Canary Seed	104 – 106		
Mustard	92-98		

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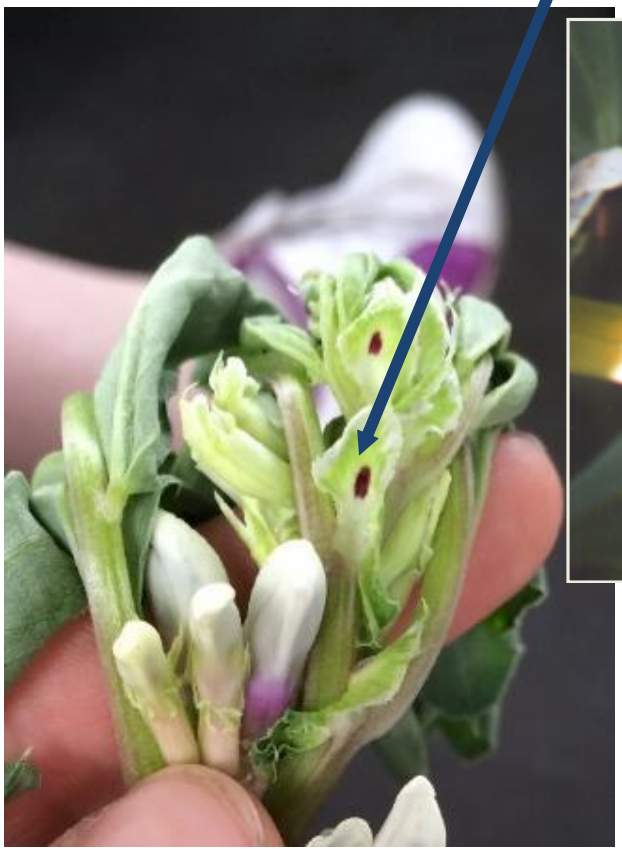
Types

Tannin Containing (8-9%)

(brown seed coat & black dot)



Low Tannin (Zero) (1%)

(white flower & cream seed coat)

Variety	Type*	Breeding Program/Distributors	Seed size	DTM
Snowdrop	Low Tannin	University of Saskatchewan / SPG	335	104
Snowbird	Low Tannin	Limagrain Nederland Bob Park ï Lacombe, AB	495	104
Imposa	Low Tannin	Limagrain Nederland Cyre Seed Farms	695	107
Tabasco	Low Tannin	NPZ Lemke / DL seeds	530	106
Taboar	Tannin	Globe Seeds - Netherland Terrramax	480	107
CDC Fatima	Tannin	University of Saskatchewan Legumex Walker	520	105
Malik (FB 9-4)	Tannin	University of Saskatchewan Saskcan Pulse Trading/AGT	680	104
CDC SSNS-1	Tannin	University of Saskatchewan Meier Brothers	335-350	105
Florent	Tannin	NPZ Lemke / DL Seeds	660	107
Fabelle	Tannin	*NPZ Lemke / DL Seeds??*	533	105
Vetigo	Tannin	*NPZ Lemke / DL Seeds??*	571	106

Seeding rates

- Target 45 plants/m^2 (4-5/ft^2)
- 60 lbs/bushel
- Know your seed size!

	TKW (g)	kg/ha	bu/acre
Malik (FB9-4)	680 (805)	360	**5.3** (6.3)
Snowbird	495	262	**3.9**
SSNS-1	335	177	**2.6**

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SK 2015 Acres

Variety	Total Seeded Acres	% of total acres	% of acres with known
CDC Snowdrop	17516	28%	38%
Snowbird	12650	20%	27%
Malik (FB9-4)	7905	13%	17%
TABOAR	6997	11%	15%
FLORENT	1245	2%	3%
UNKNOWN	15479	25%	
Total	61792		

Source: Saskatchewan Crop Insurance Corp.

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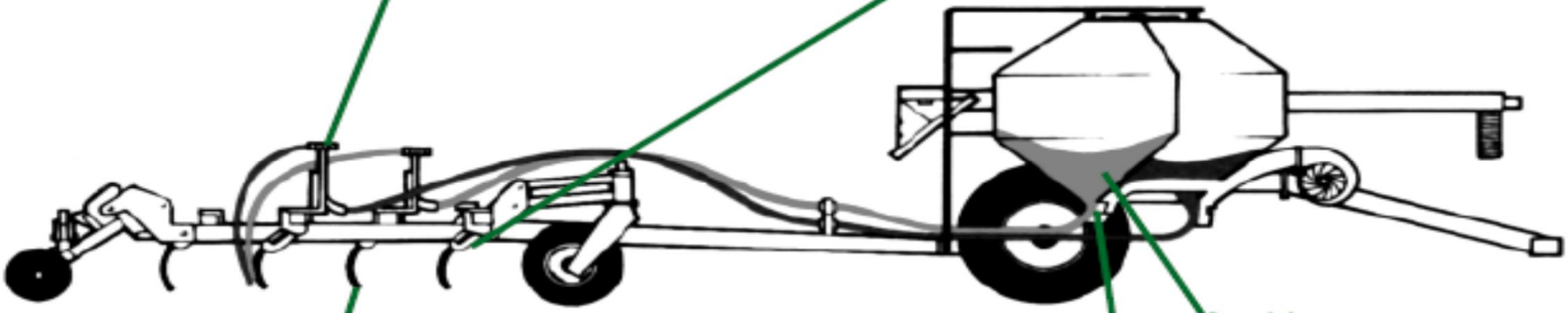
Seeding

- **2-3 inches deep**
- **Open pollinate** - Keep types/varieties separate by at least 100m (Dr. Vandenberg suggests 500m) or will have a lot of outcrossing
- **Seed treatments** – low tannin varieties higher risk (Apron products/ Stress Shield)

Distributer heads
Seeds can be damaged as they hit the distributor head.

Blockages occur at outlet holes.

Tubes
Hoses block on bends.

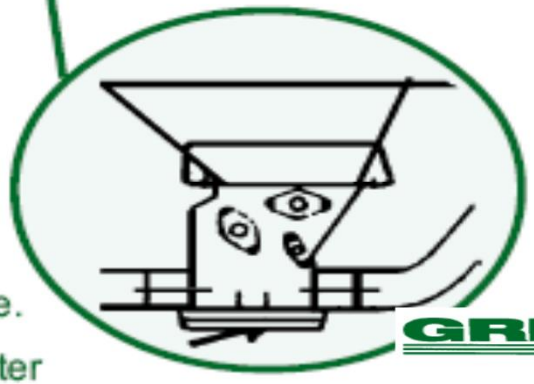


Seed box
Check for bridging, especially following transport.

Seeding boot
Blockages occur, especially if boot narrows or changes in shape from circular to oblong.

Metering device
Check roller type for seed clearance and possible seed damage.

Check device can meter correct seeding rate.



GRDC

NSW Agriculture

Go slow!!! Check often!!!

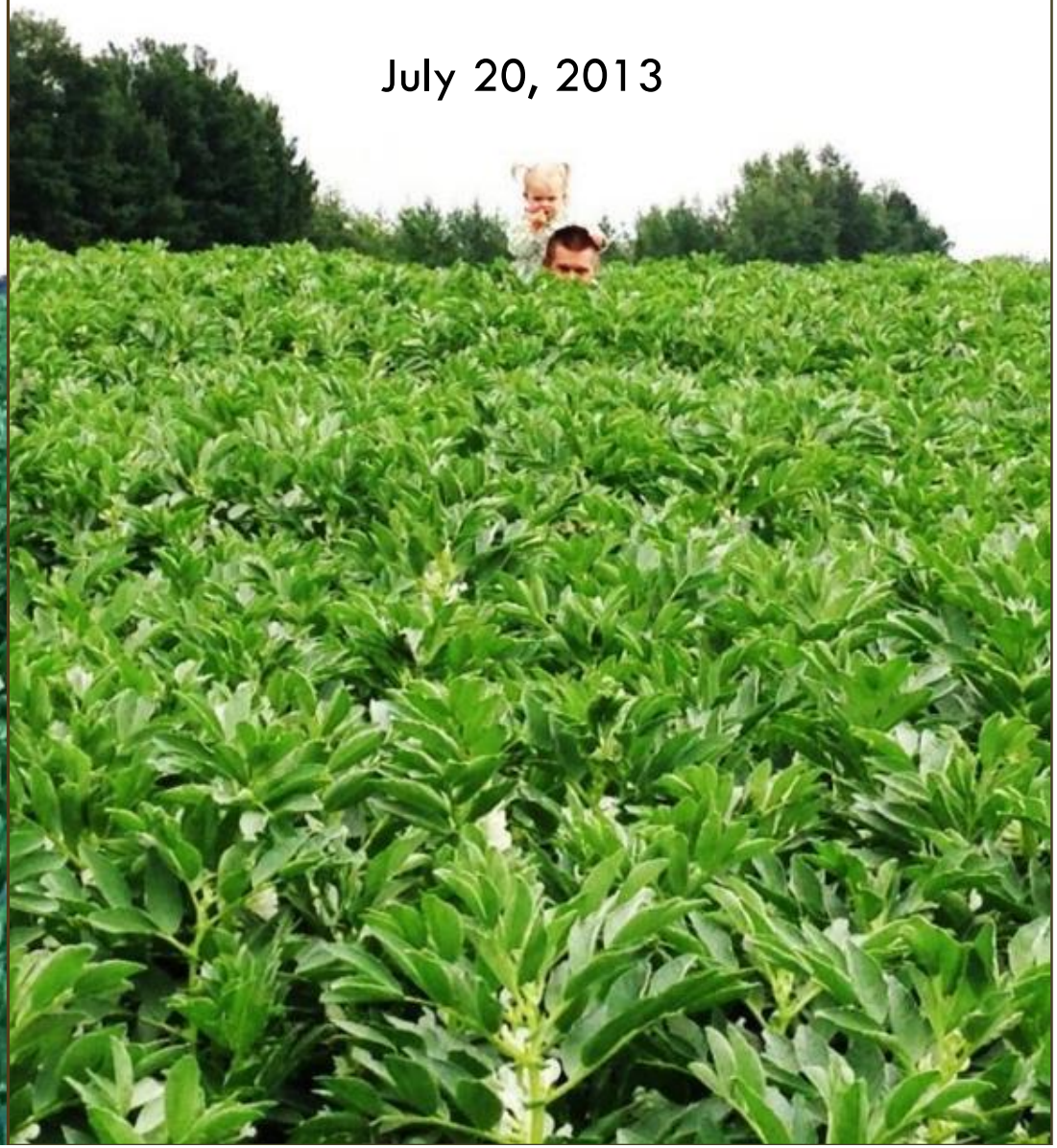
Source: S. F

Potential For Huge Biomass

Source: Olson, M.A. 2014

July 5, 2013

July 20, 2013



Fertility

Compiled by the CFI Canadian Fertilizer Institute Institut canadien des engrais

Oilseeds		N	P_2O_5	K_2O	S
Pulse Crops*			lbs/acre		
Peas	uptake	138 - 168	38 - 46	123 - 150	11 - 14
50 bu/A *(3360 kg/ha)*	removal	105 - 129	31 - 38	32 - 39	6 - 7
Lentils	uptake	82 - 101	22 - 27	69 - 84	8 - 10
30 bu/A *(2016 kg/ha)*	removal	55 - 67	17 - 20	29 - 36	4 - 5
Fababeans	uptake	257 - 314	89 - 108	229 - 280	12 - 15
50 bu/A *(3808 kg/ha)*	removal	154 - 188	55 - 67	47 - 57	6 - 8

- Faba much higher uptake of P and K than peas
- Max. safe rate seed placed P is 40 lb/acre actual (P+K)

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P Fertility Continued

- Pulses do not respond well to addition of P fertilizer but are good scavengers
  - acidity root zone and solubilize calcium phosphates that are common in our soils
- consider P fertilizer as replacement strategy as we need to replace what is removed
- faba beans remove 1.1 to 1.3 lbs of P2O5 for every bushel produced!

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Inoculant products

Rhizobium leguminosarum: pea, lentil, faba, chickling vetch

Faba bean specific products:

BASF(formerly BeckerUnderwood) - Nodulator® peat

Monsanto Bio-AG (formerly Novozymes) - Tag Team granular

Farmer used with good success:

Monsanto Bio-AG - Cell-Tech granular inoculant for pea

Loveland Products - Establish™ granular (pea)

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Source: NARF 2015 Seed applied + granular

No inoculant vs Seed Applied

Faba bean inoculant trial ï G. Hnatowich, ICDC
Indian Head site July 21 2015

Inoculated vs No inoculant

Faba bean inoculant trial ï G. Hnatowich, ICDC Indian Head site July 21 2015

Source: S. Phelps, SPG 2015

Residual Herbicides

Year (or season) after application that faba beans can be grown

5 + years - Tordon 22K, Grazon (Spot treatments or broken pasture)

4 + years - Ally Toss-N-Go (cropland), Escort (broken pasture)
(persistence is extended when soil pH is 7.5 or greater)

2nd season after application (ie. 18 months recropping)

Muster (Toss-N-Go / Gold II), Assert, Everest, Triton C

Clopyralid (<123 gai/ac)
(Lontrel, Curtail M, Prestige XC, Eclipse III, Flaxmax, Spectrum*)

Banvel II/Oracle (high rates >0.5L/ac)

PrePass (fall application)

2,4-D (high rates applied in fall)

Best Guess as little work on recropping to faba beans!!

Weed Control (registered products)

Pre-emergence products:

Glyphosate

Glyphosate + Express (Tribenuron)

Edge

Trifluralin / Trifluralin + Sencor (metribuzin)

In crop:

Basagran & Basagran Forte

Odyssey

Poast Ultra (grassy weed control)

Assure II (quizalofop) (grassy weed control)

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Pest Management

Grow it…they will come……

Source: Olson, M.A. 2014

Lygus

- 4 species
- Higher risk areas in SK are where high canola or alfalfa acres (NE and Meadow Lake)
- Max 1% damage for No. 1 grade
- Hard to control as insect moves back in after insecticide application

Source: S. Phelps, SPG 2014

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Source: Olson, M.A. 2014

Primary and export grade determinants tables

Fababeans, Canada (CAN)

	Standard of quality		Damage				Foreign material				
Grade name	Degree of soundness	Splits %	Heated or rotted %	Mouldy %	Perforated damage %	Total %	Excreta %	Insect parts %	Sclerotinia %	Stones or shale %	Total %
No. 1 Canada	Reasonably well matured, reasonably good natural colour	6	Nil	Nil	1	4	0.01	0.02	0.05	0.1	0.2
No. 2 Canada	Fairly well matured, fair colour	9	0.3	0.6	3	6	0.01	0.02	0.05	0.2	0.5
No. 3 Canada	Cool and sweet, excluded from higher grades on account of immaturity, poor colour or damage	12	1	2	3	10	0.01	0.02	0.05	0.5	2
Grade, if No. 3 specs not met		*Fababeans, Sample Canada Account Splits*	*Fababeans, Sample Canada Account Heated*	*Fababeans, Sample Canada Account Mouldy Kernels*	*Fababeans, Sample Canada Account Damaged*	*Fababeans, Sample Canada Account Damaged*	*Fababeans, Sample Canada Account Excreta*	*Fababeans, Sample Canada Account Admixture*	*Fababeans, Sample Canada Account Admixture*	*2.5% or less—Fababeans, Rejected (grade) Account Stones, or Fababeans, Sample Canada Account Stones Over 2.5%—Fababeans, Sample Salvage*	*Fababeans, Sample Canada Account Admixture*

Aphids

Source: S. Phelps, SPG 2015

Other Insects

Blister Beetles

Pea Leaf Weevil

Grasshoppers

Leafhoppers (AY)

Source Sask. Agric.

Disease

Chocolate Spot – botrytis

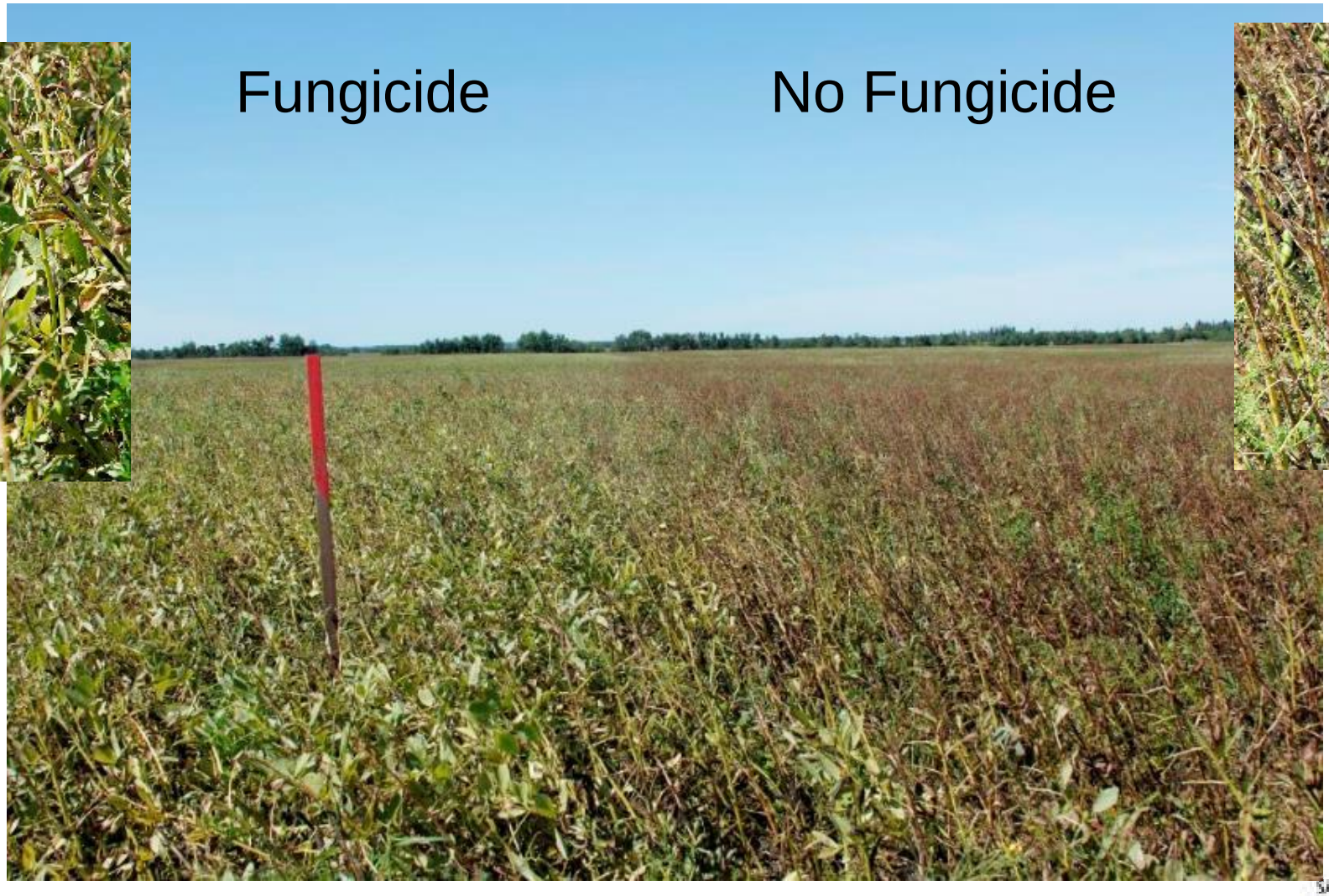
Ascochyta

Alternaria

Sclerotinia

Source: S. Phelps, SPG 2015

Disease



Photos: K. Stonehouse, SMA (North of Tisdale)

Leaf Burning = not choc spot

Source: S. Phelps, SPG 2015

Source: S. Phelps, SPG 2015

Source: D. Gregoire, North Battleford, 2015

Faba Bean Growth Stages

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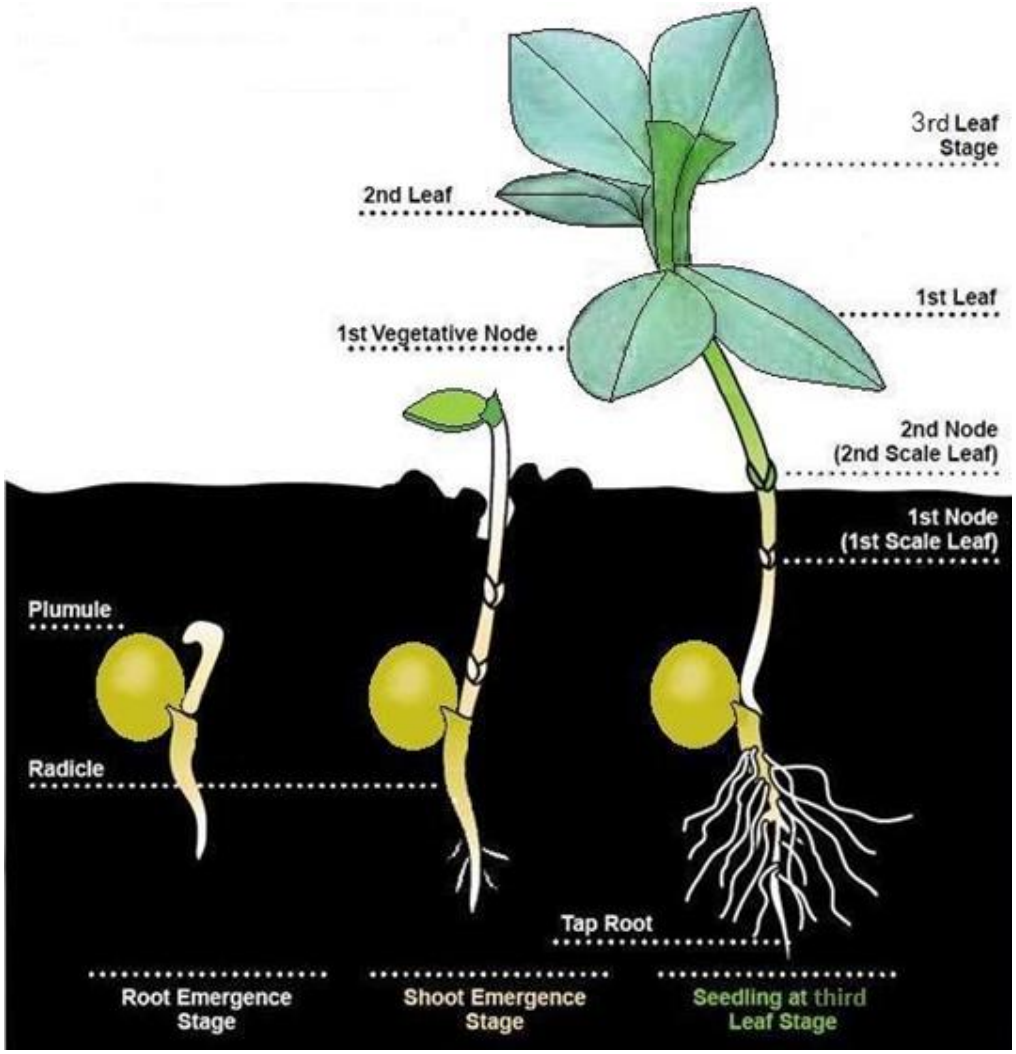
3rd Leaf Stage
2nd Leaf
1st Leaf
1st Vegetative Node
2nd Node (2nd Scale Leaf)
1st Node (1st Scale Leaf)
Plumule
Radicle
Tap Root
Root Emergence Stage
Shoot Emergence Stage
Seedling at third Leaf Stage


Source: S. Phelps, SPG 2015

Seeding depth ï 1.5 to 2ò

Source: S. Phelps, SPG 2015

Frost & Cutworms
- Regrowth from seed

Source: S. Phelps, SPG 2015

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4 true leaf

1 node/week

Source: S. Phelps, SPG 2015

Flowering

Start flowering 8-10 node stage = 12” high

Flowers located approx. 8”

<u>BBCH Staging guide suggests:</u>

Start of flowering – 1 flower open on 1 raceme per plant

Full flower - flowers open at 5 racemes/plant

End of flower - first pods visible

Only about ¼ of flowers produce pods

Flowers/pods abort:

->27 degrees C

-Hot & dry during podding

-Lack of pollinators (bees)

Source: S. Phelps, SPG 2015

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3-4 seeds per pod average

Source: S. Phelps, SPG 2015

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Harvest Management

- Å GlyPhysiologically mature when 90% of plants have color change
- Å phosate & Reglone registered
  - Å Timing - “most plants are ripe and dry. Pods fully filled, bottom pods are tan or black”
  - Å With Reglone – high water volumes (20 gallons/acre)

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Combining

- straight cut approximately 6-8”off the ground
  - shorter stubble allow easier seeding(no plugging between shanks) the next spring.
- 16% moisture is dry
- combine at 18-20% and aerate
- Don’t use lifters (pop pods)

“Amazing to combine….quiet….just hear the grain coming in the tank”

2015 Experience – dry spring

Hill tops

Low area

Source: S. Phelps, SPG 2015

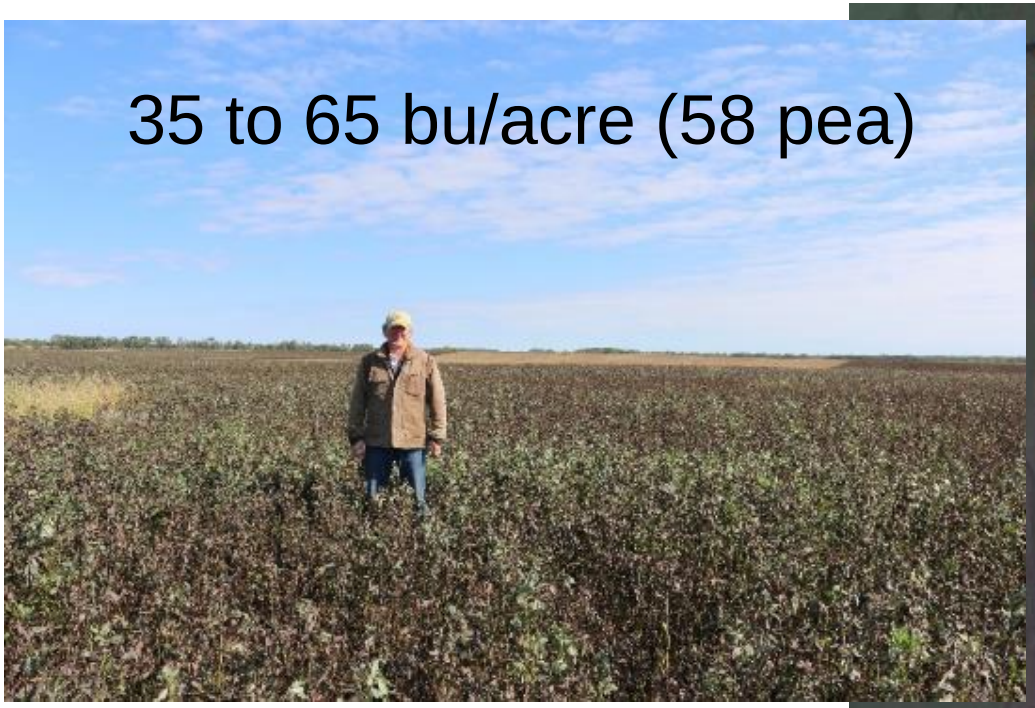
End of July

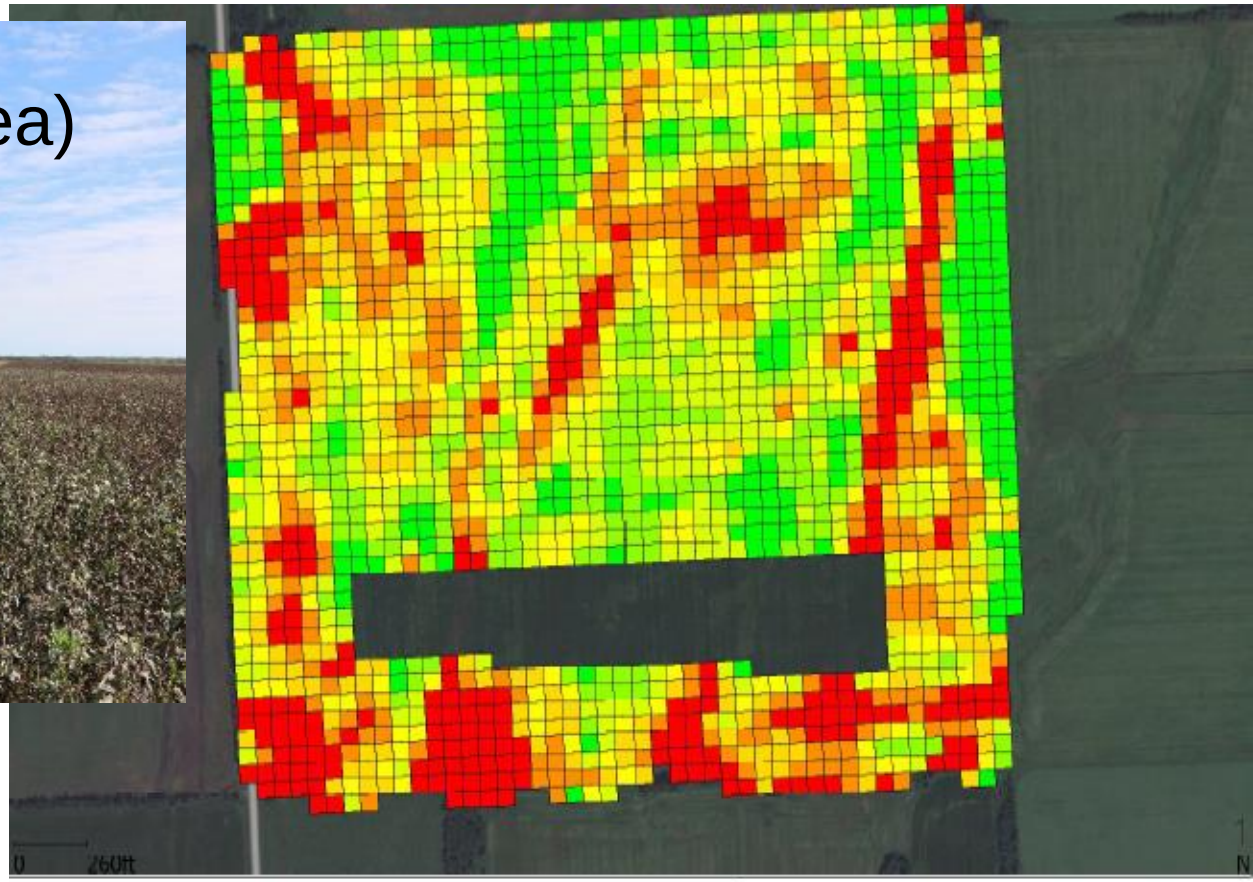
Source: S. Phelps, SPG 2015

Outlook July 30 (ICDC Variety Trials)

Source: S. Phelps, SPG 2015

Medstead (Terrel Hill)





Source: S. Phelps, SPG 2015

Operation Summary

Grower : Terrel Hill
Field : GERALDS
Year : 2015
Operation : Grain Harvest
Crop / Product : FABABEANS
Area : 137.06 ac
Avg. Moisture : 10.68 %
Average Estimated Volume (Dry) : 52.01 bu/ac

Estimated Volume (Dry)
(bu/ac)

64.30 - 102.96	(22.36 ac)
58.50 - 64.30	(22.44 ac)
54.23 - 58.50	(22.36 ac)
50.44 - 54.23	(22.44 ac)
46.53 - 50.44	(22.36 ac)
41.87 - 46.53	(22.44 ac)
7.64 - 41.87	(22.36 ac)

Cavalier Agrow

iFARM
Intelligent Farming


Source: S. Phelps, SPG 2015
20 bu/acre

Pod splitting

Source: S. Phelps, SPG 2015

Low podding

- consider rolling after seeding

Source: S. Phelps, SPG 2015

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Frost?

Source: S. Phelps, SPG 2015

Regrowth

Source: S. Phelps, SPG 2015

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Thank You!!!

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Source: S. Phelps, SPG 2015

@AgronomistSPG

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