

Potential causes of yield instability in canary seed


Soils and Crops 2015

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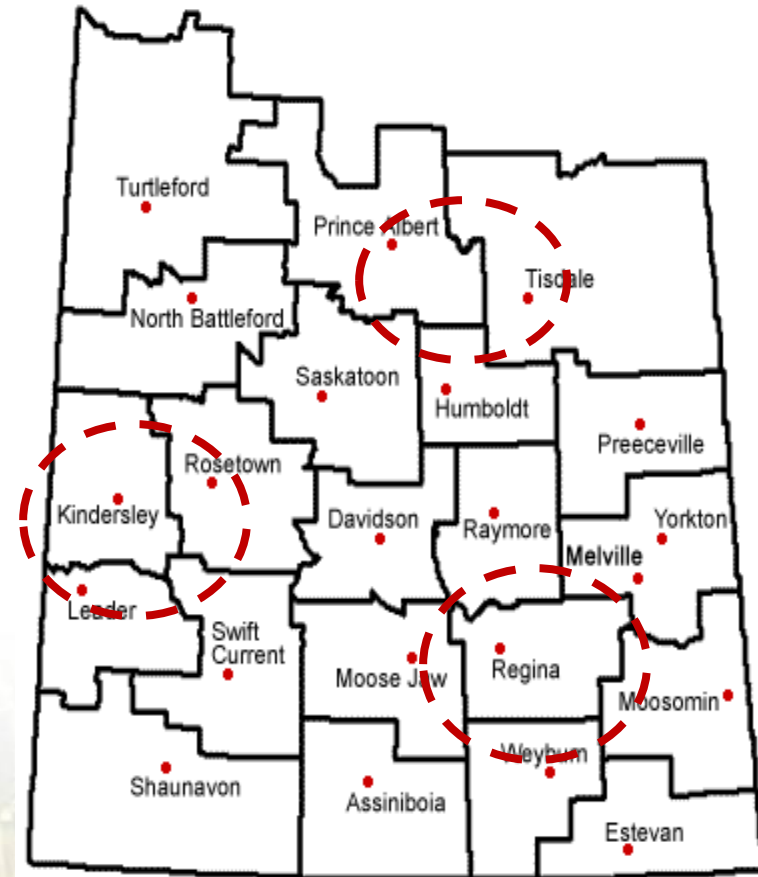
University of Saskatchewan - Department of Plant Sciences



Picture courtesy: Konstantinos Xyntaris

Introduction to the crop

canaryseed origin



producers: Canada, Argentina and others

farm cash receipts: up to \$82 million

Saskatchewan: 89-98% Canada's production

specialty crop, seeded area: 4.9 – 19% of specialty crops

Uses of canaryseed (*Phalaris canariensis* L.)

current use: feed mixtures



http://www.birdsvalleybirdseed.ca/other_products.php

potential use: human consumption



https://www.google.ca/search?q=harvest+in+canada&source=lnms&tbm=isch&sa=X&ei=UuVeUt3KcYKkIAL1uoDYBA&ved=0CAcQ_

Problem statement and aim

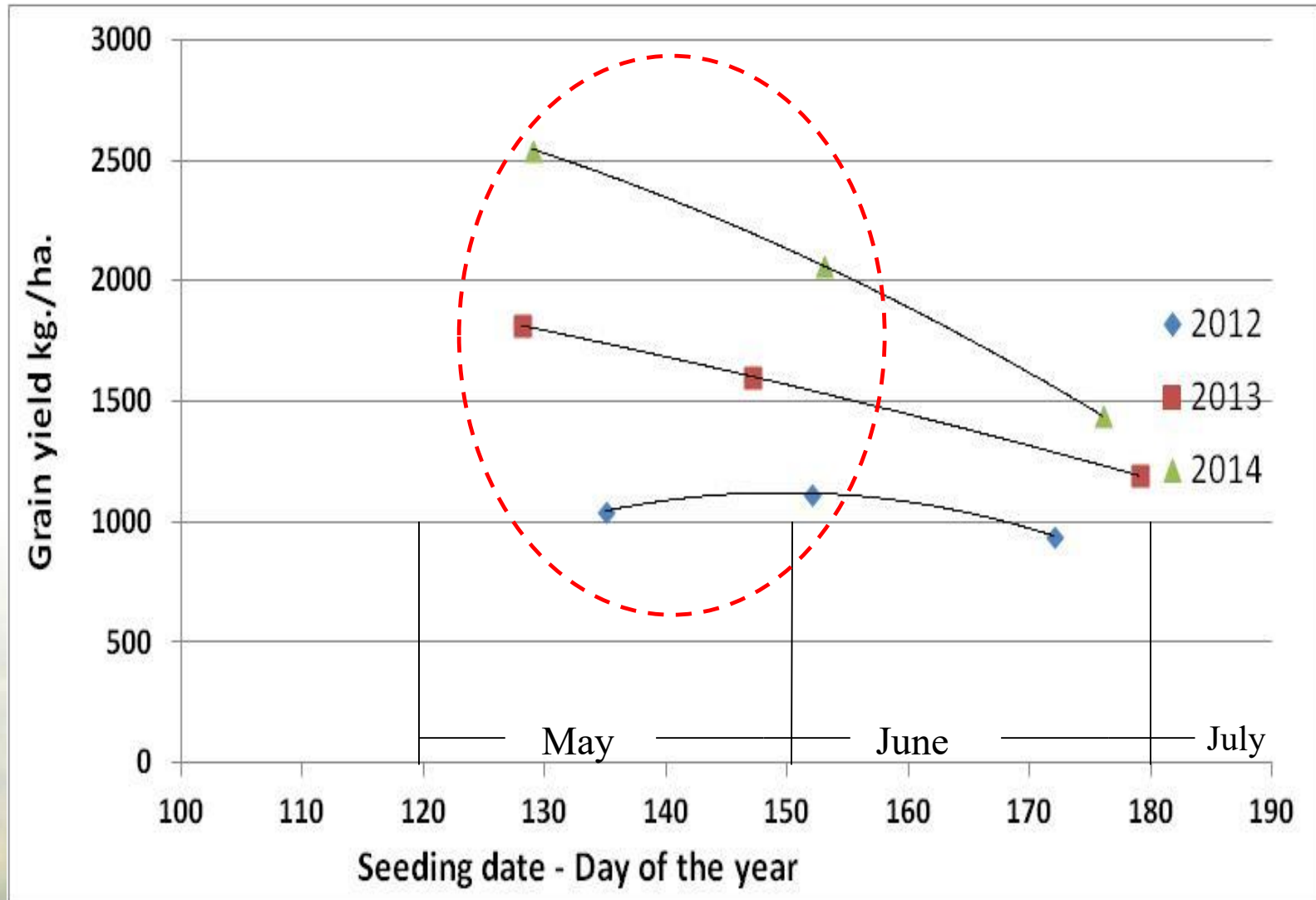
- unstable yield
- lower yield compared to other spring cereals

Grain yield variability recorded in SK

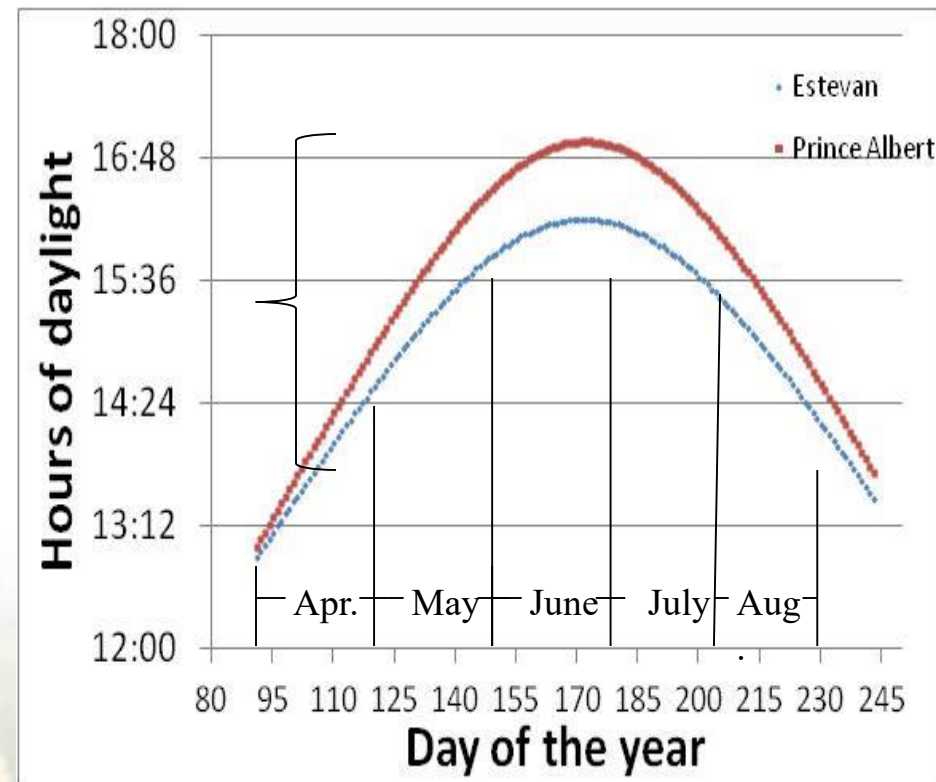
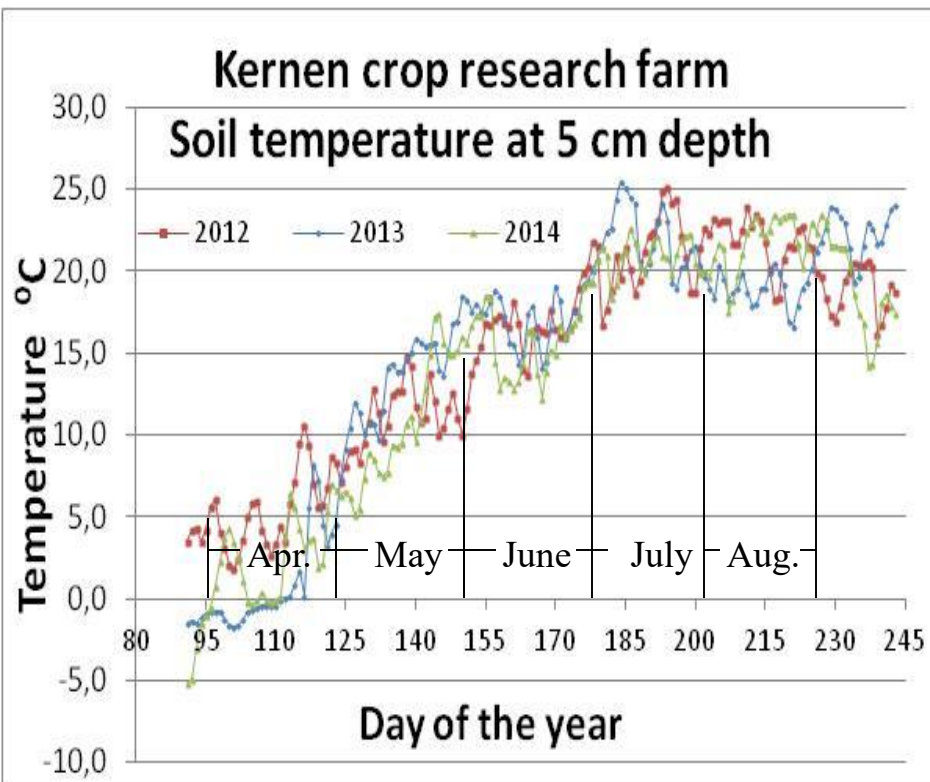
Crop year	characteristic	Yields recorded by rural municipality (Kg./ha.)	Yield variability
2001	drought	150 - 1600	11fold
2010	late seeding	135 - 1750	13fold
2013	high yields	489 - 2087	4fold
		135 - 2087 (among site-years)	>15fold

Sowing beyond mid-May  Lower yield (May *et al.* 2012)

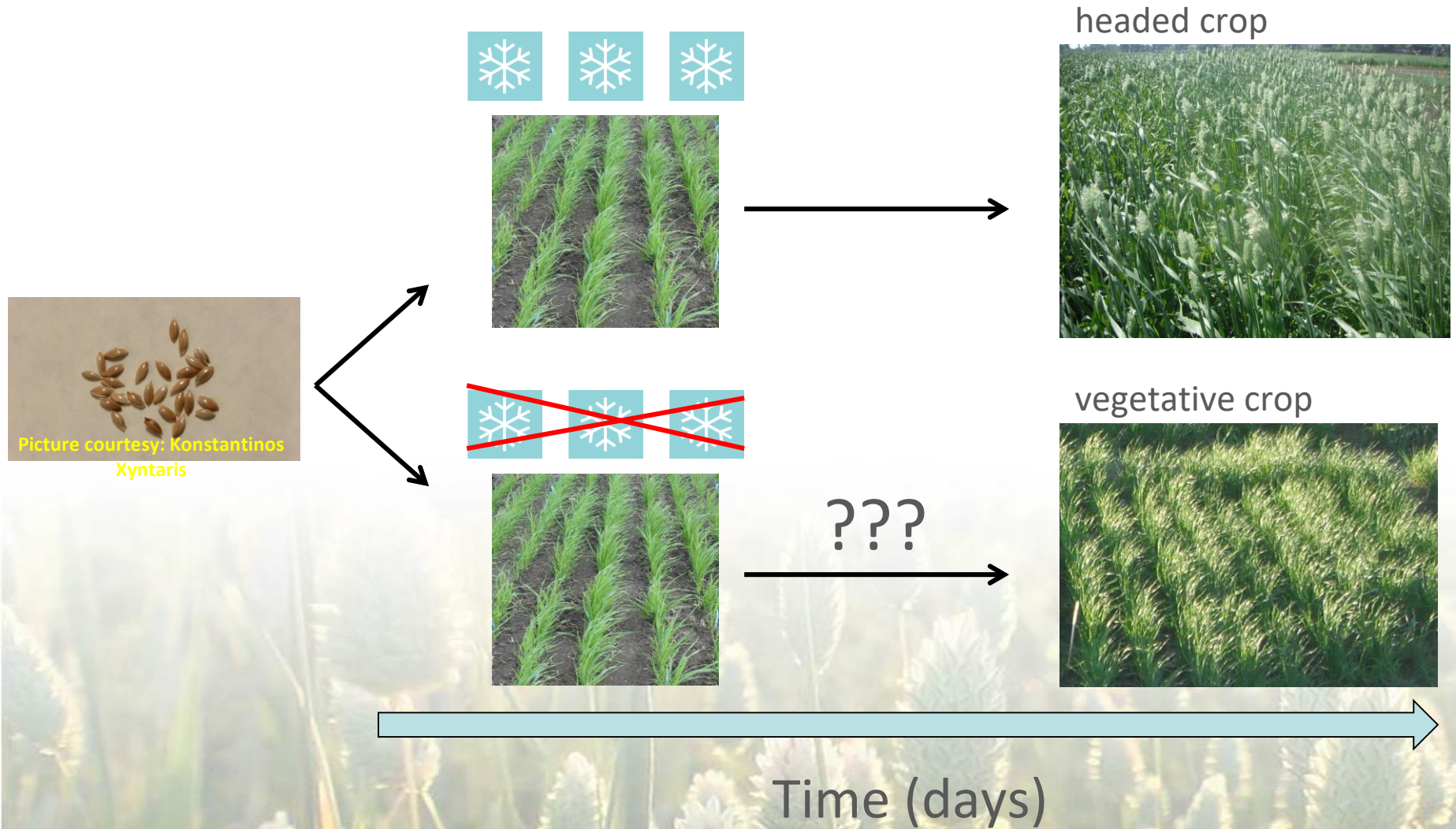
Canary seed grain yield as affected by seeding date



Temperature and day-length at different site-years



Potential vernalization and day-length sensitivity



Field experiment 2014:

Rep.1



Rep.2



Components of grain yield in cereal crops

$$\text{Grain Yield (weight/area)} = \underline{\# \text{ seeds/area}} \times \text{weight/seed}$$

(Less important in high
canary seed yield variability)



$$\underline{\# \text{ of seeds/panicle}} \times \underline{\# \text{ of panicles}}$$

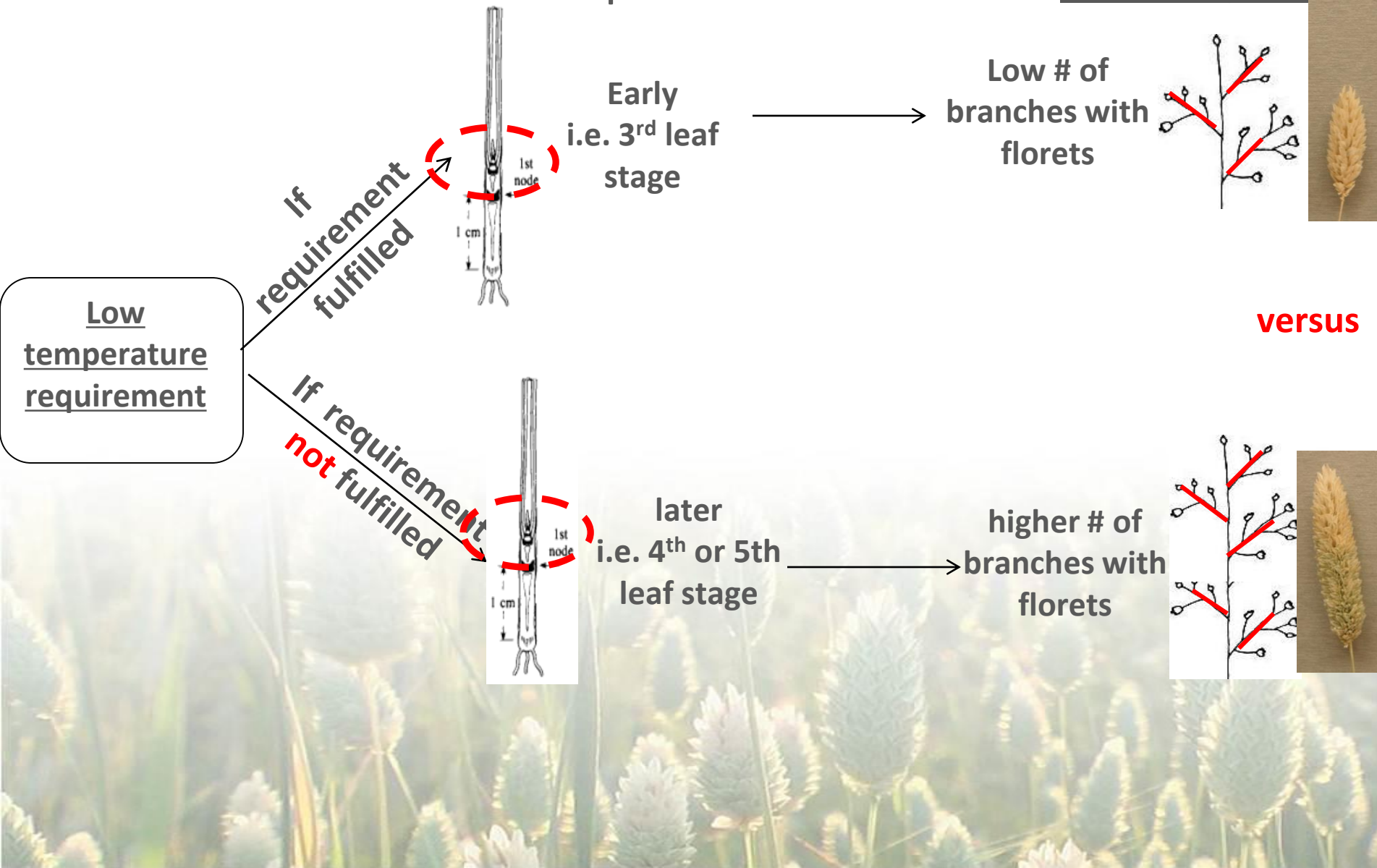


Picture courtesy: Konstantinos Xyntaris



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Potential vernalization requirement can affect # seeds/head

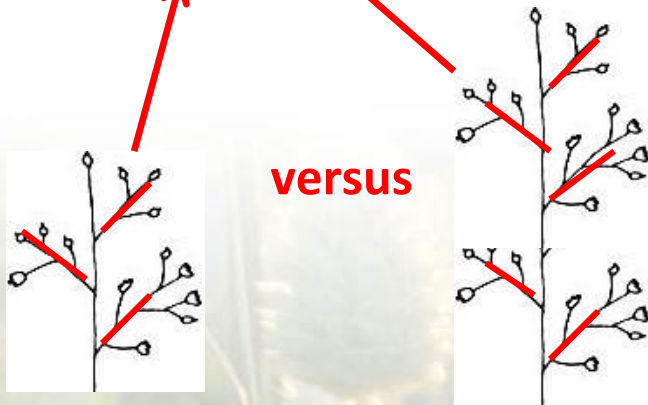


Potential day-length effect on the # seeds/panicle

Effect 1



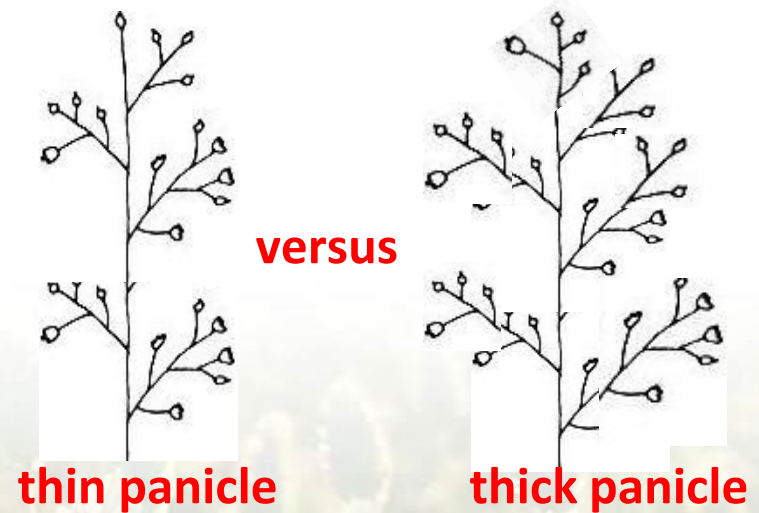
Effect 2



versus

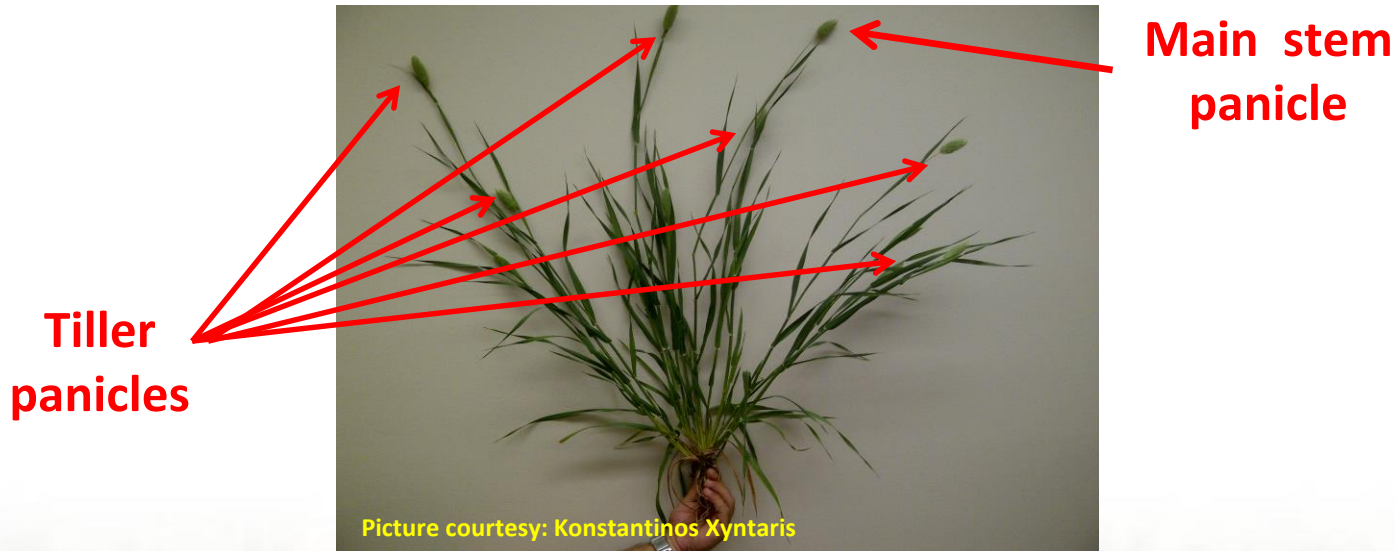
(Same as low temperature effect)

More branches with florets

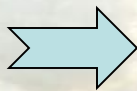


More florets/branch

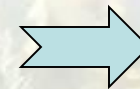
Importance of tillers in canaryseed grain yield



Late sowing of
canaryseed



Lower # of panicles/m²
(ca. 20-25%)

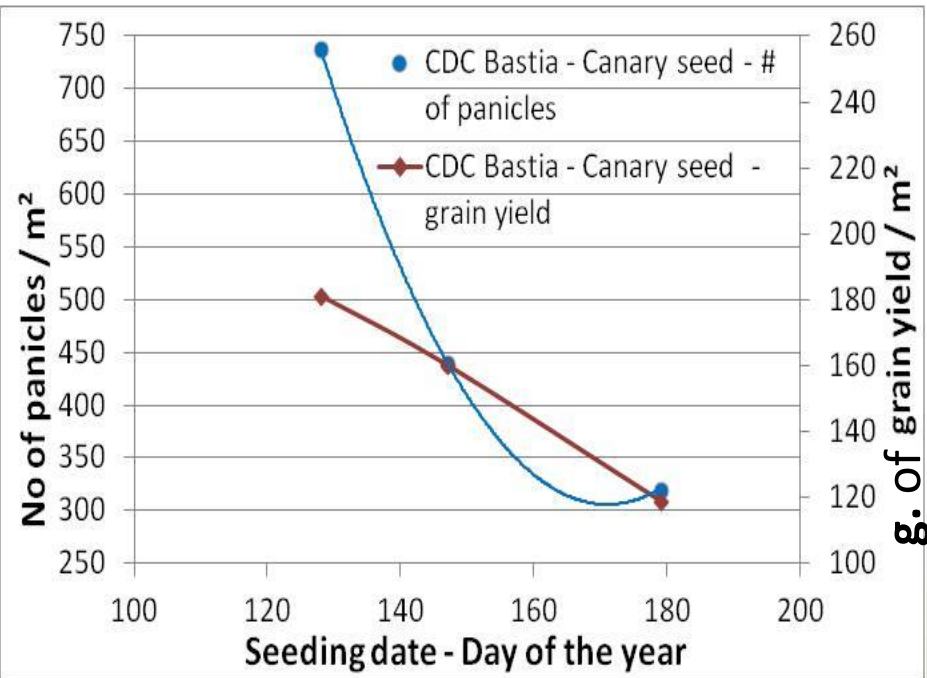


Disproportionate
yield reduction
(ca. 40%)

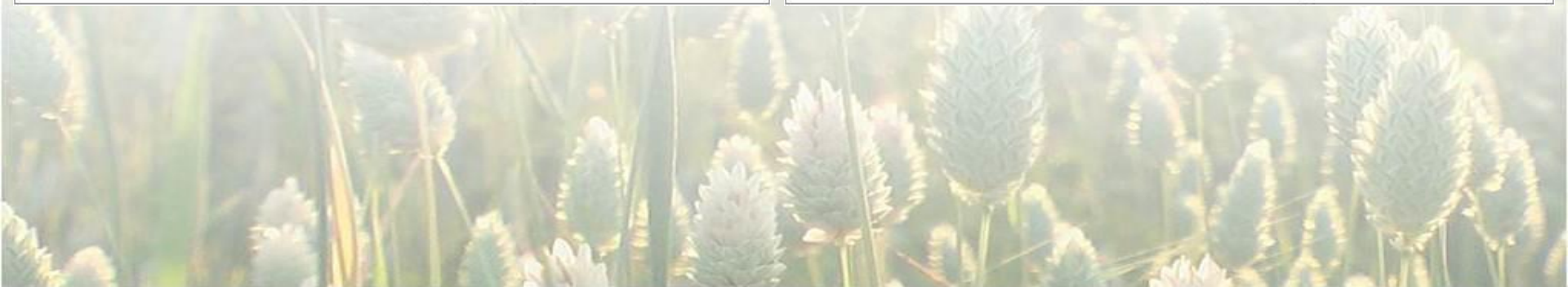
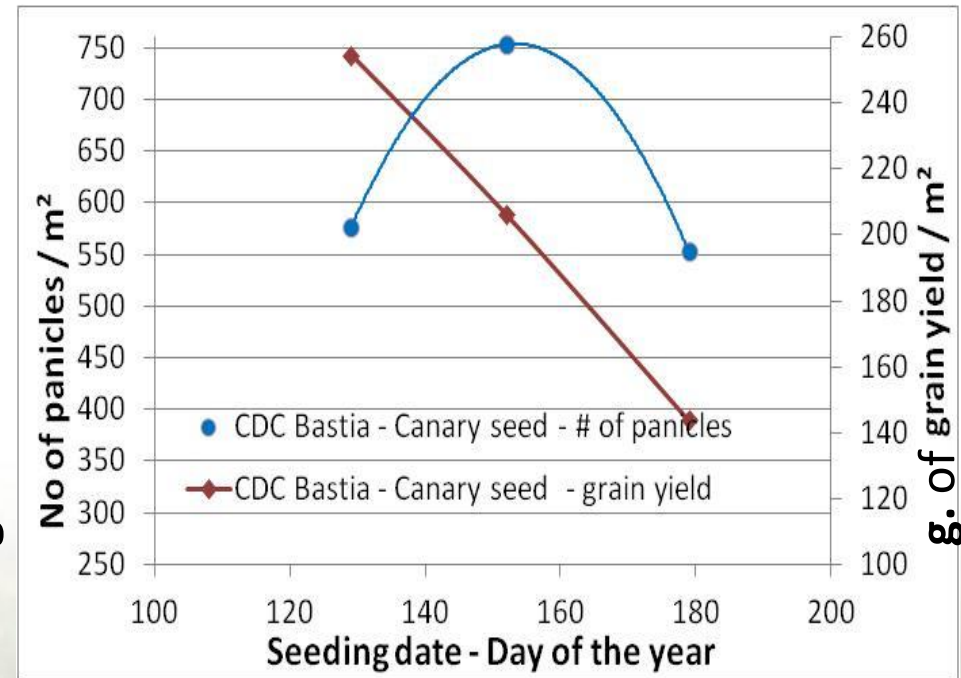
(May *et al.* 2012)

Grain yield as affected by the # of heads

2013

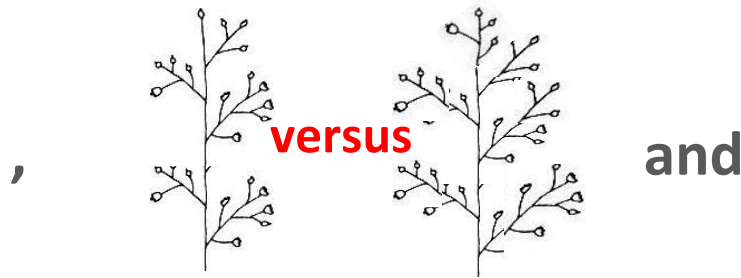


2014



Take-home message

- Grain Yield = # of potential seeds/panicle * # of panicles/area



- Do canary seed cultivars have vernalization requirement and day-length sensitivity?
- Is vernalization requirement and day-length sensitivity of canary seed cultivars responsible for the high grain yield variability?

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Thank you for your attention.
Any Questions ?