Getting the seeds out of the field and in the tank

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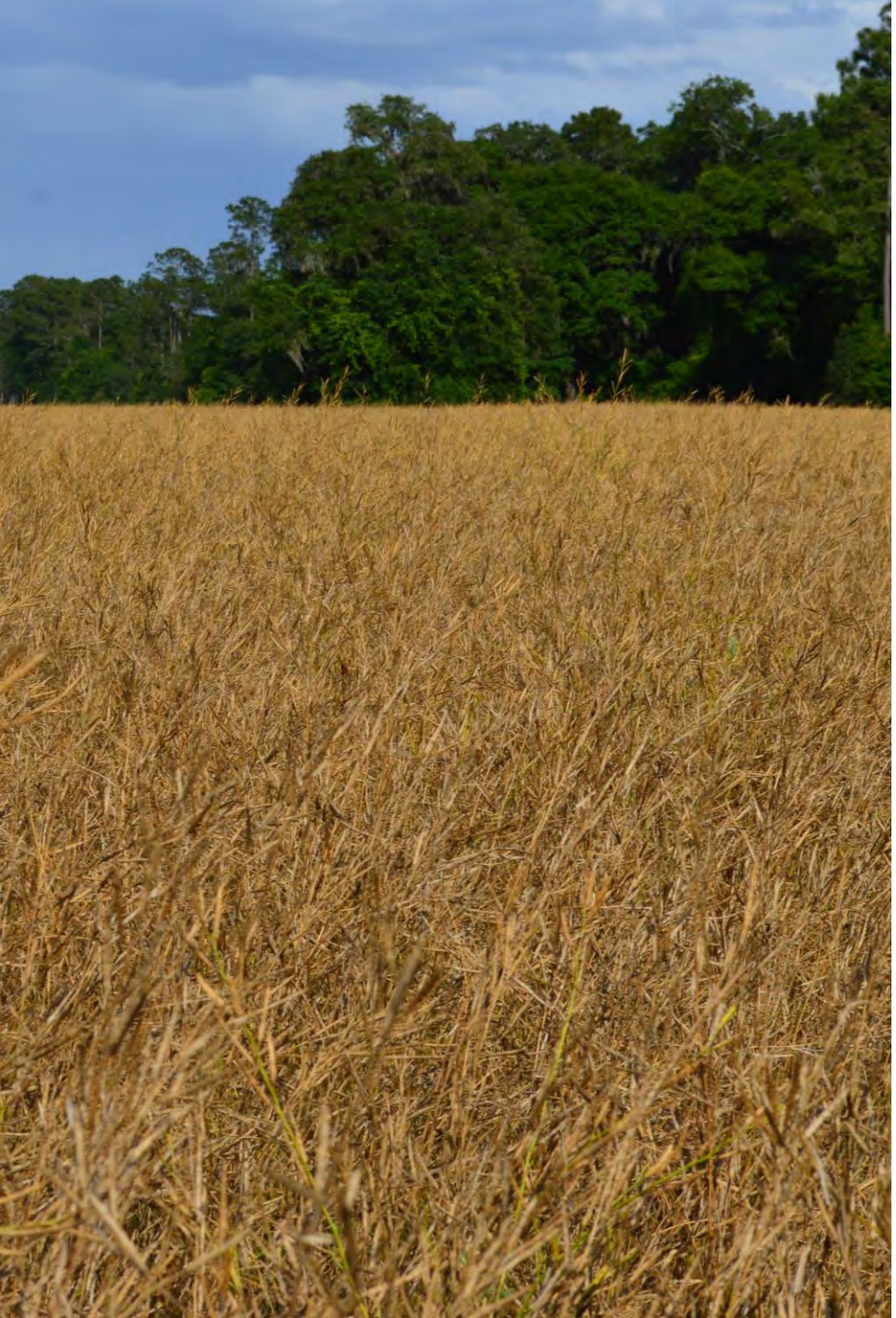
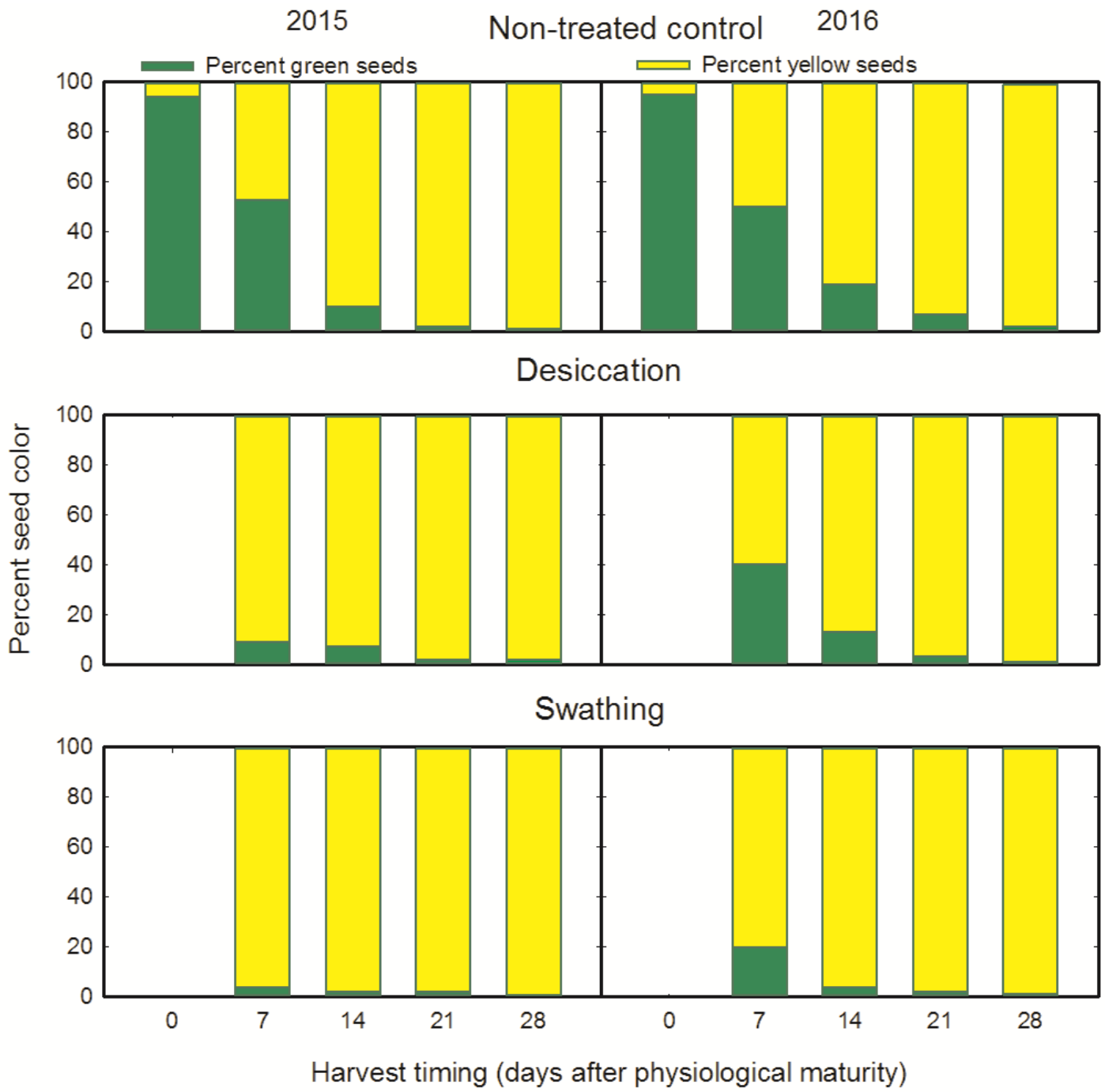


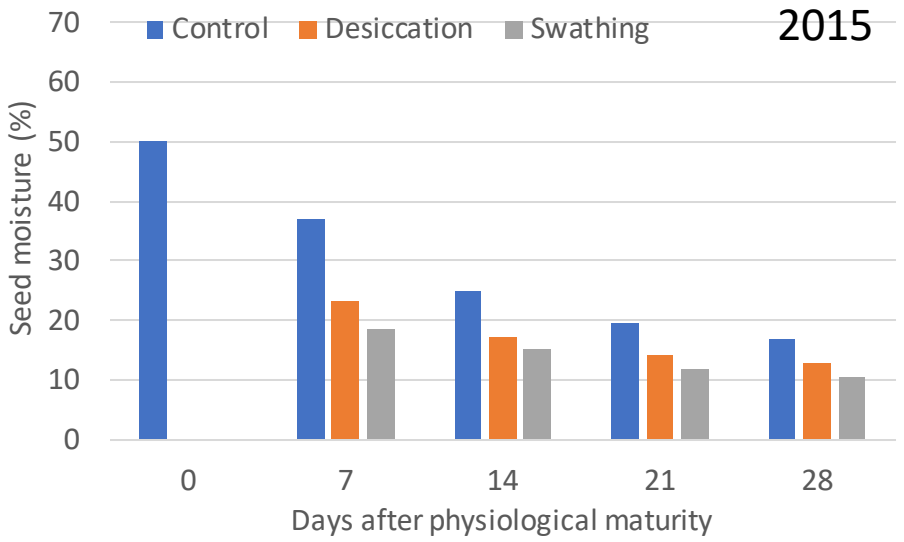
Harvest Management

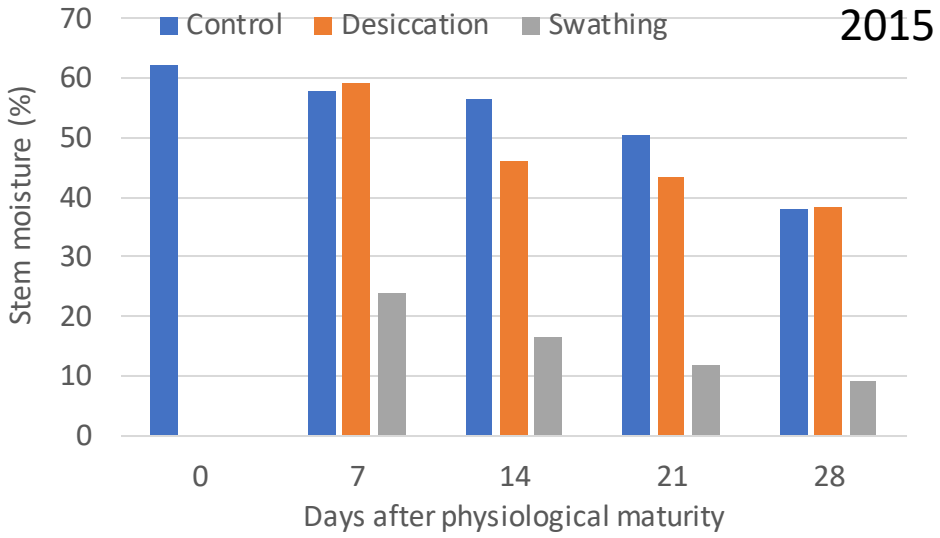
- Optimise seed quality and yield
- Minimise harvest loss
- Combine optimization and proper handling
- Timely planting of subsequent crops in double-cropped systems
- Use of desiccants to advance maturation
- Manage green tissue and weeds to improve harvest efficiency

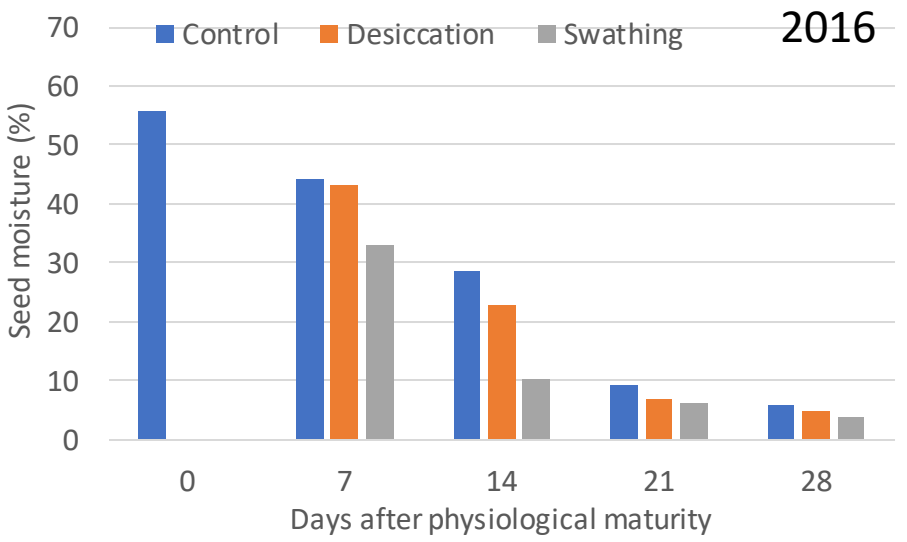
Seed maturation

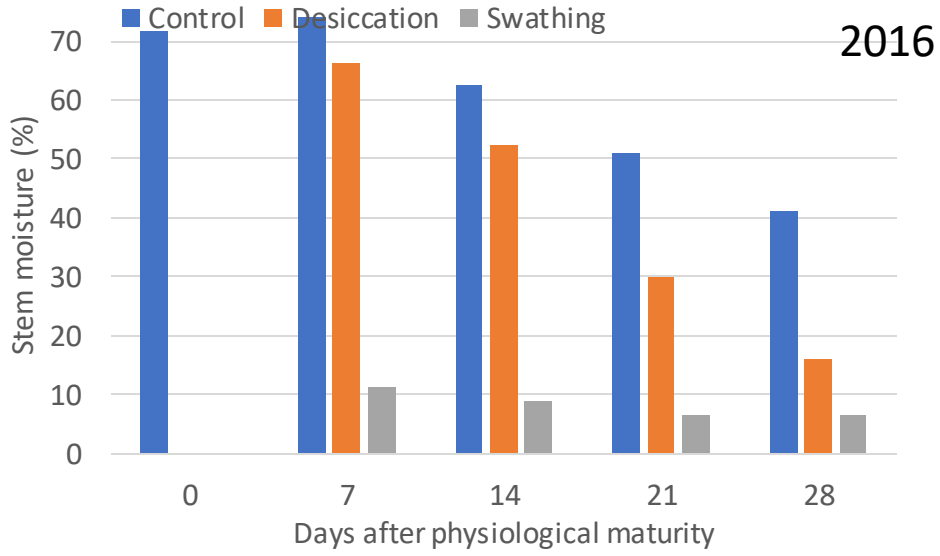


Seed and stem dry down

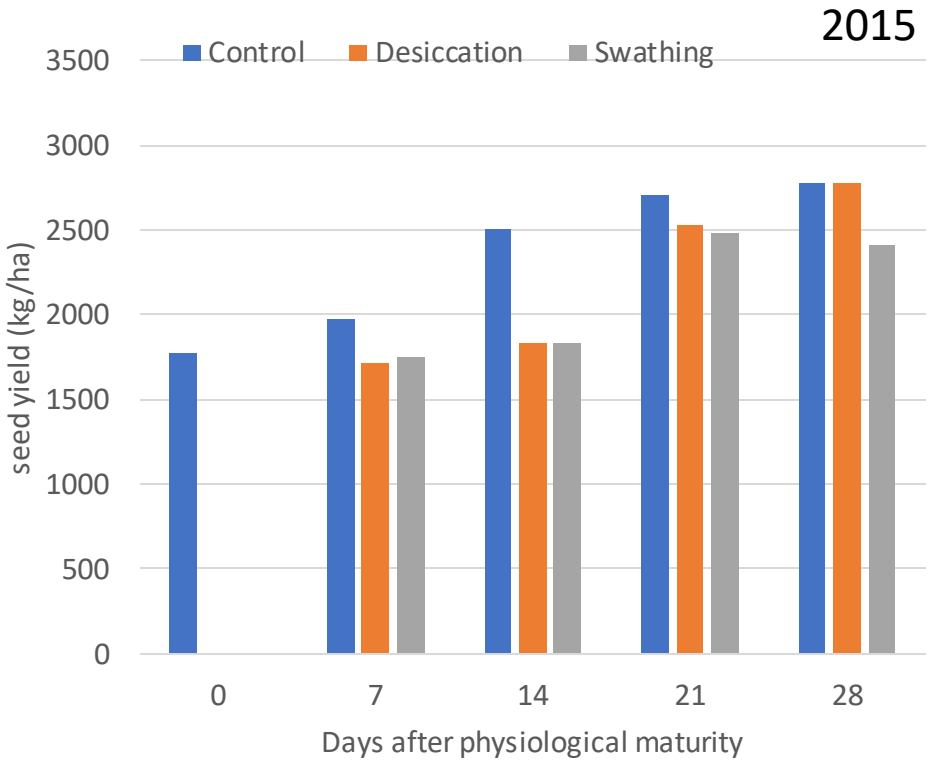


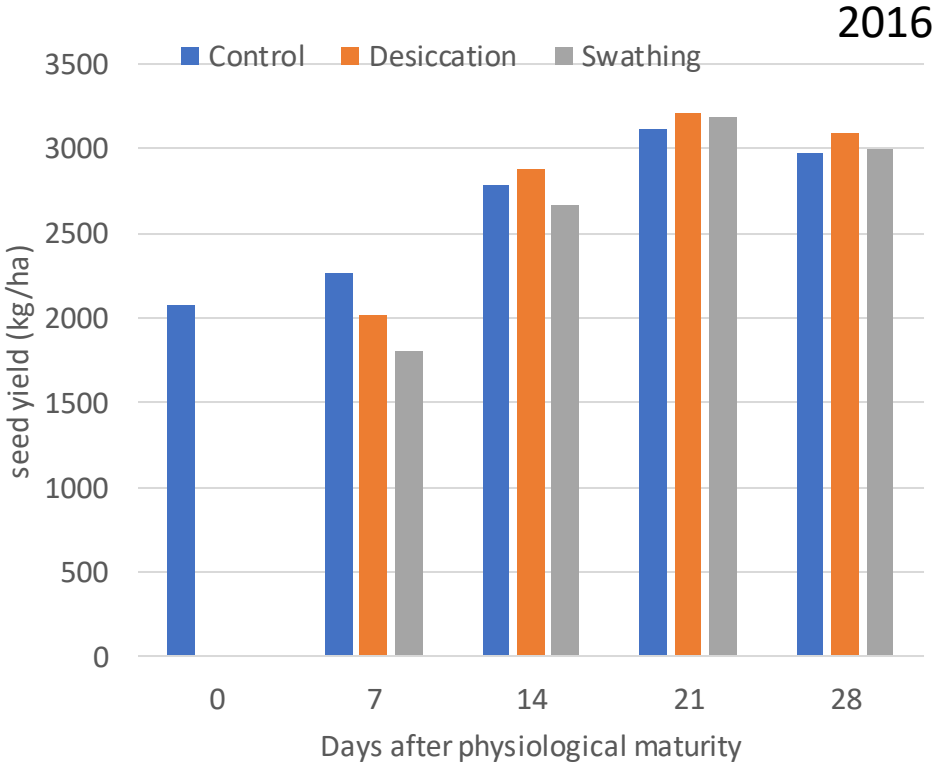




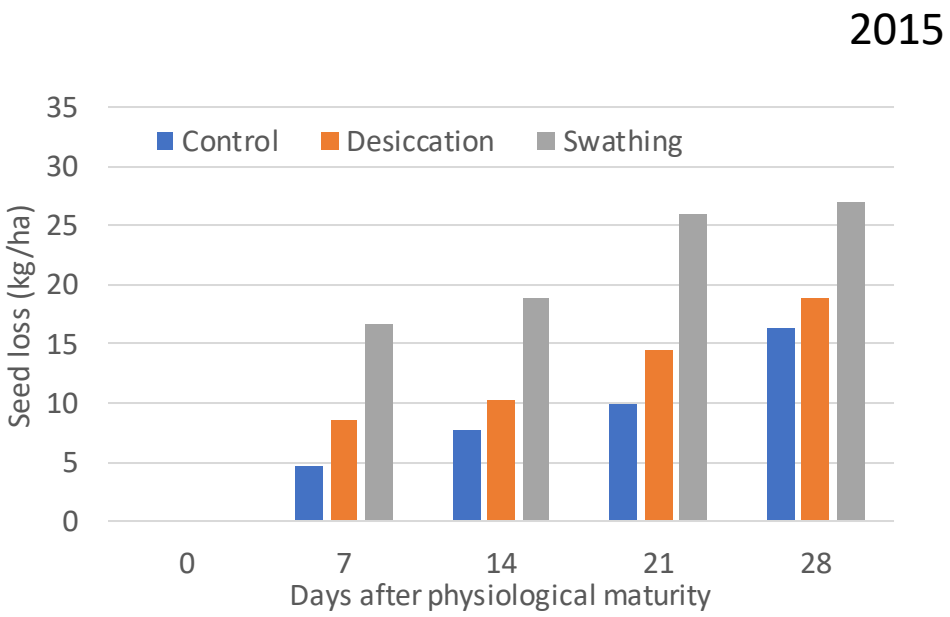


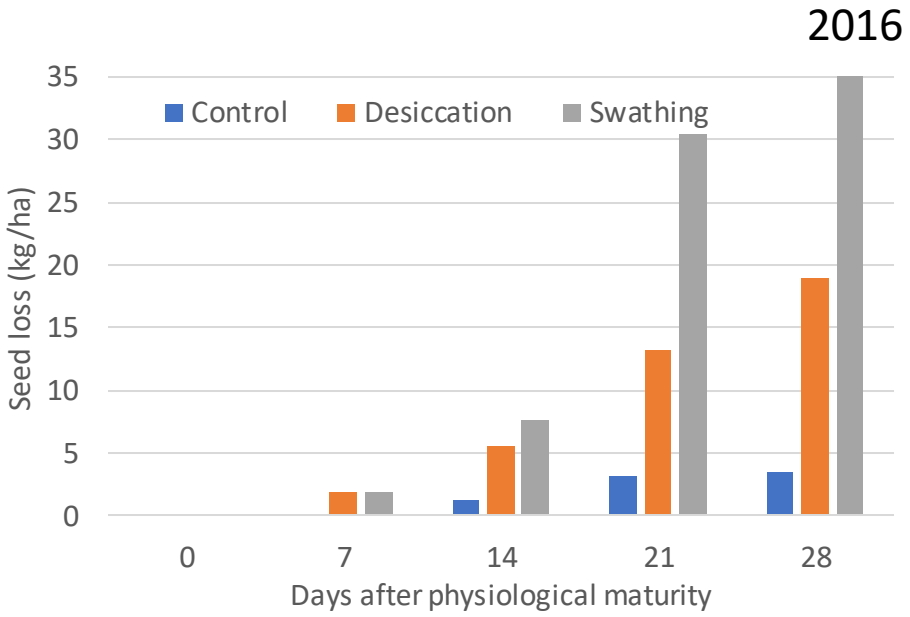
Desiccants vs. swathing





Desiccants vs. swathing





Defining Physiological Maturity

Staging carinata for chemical desiccation

Pods are tan to brown
Seeds are yellow/brown

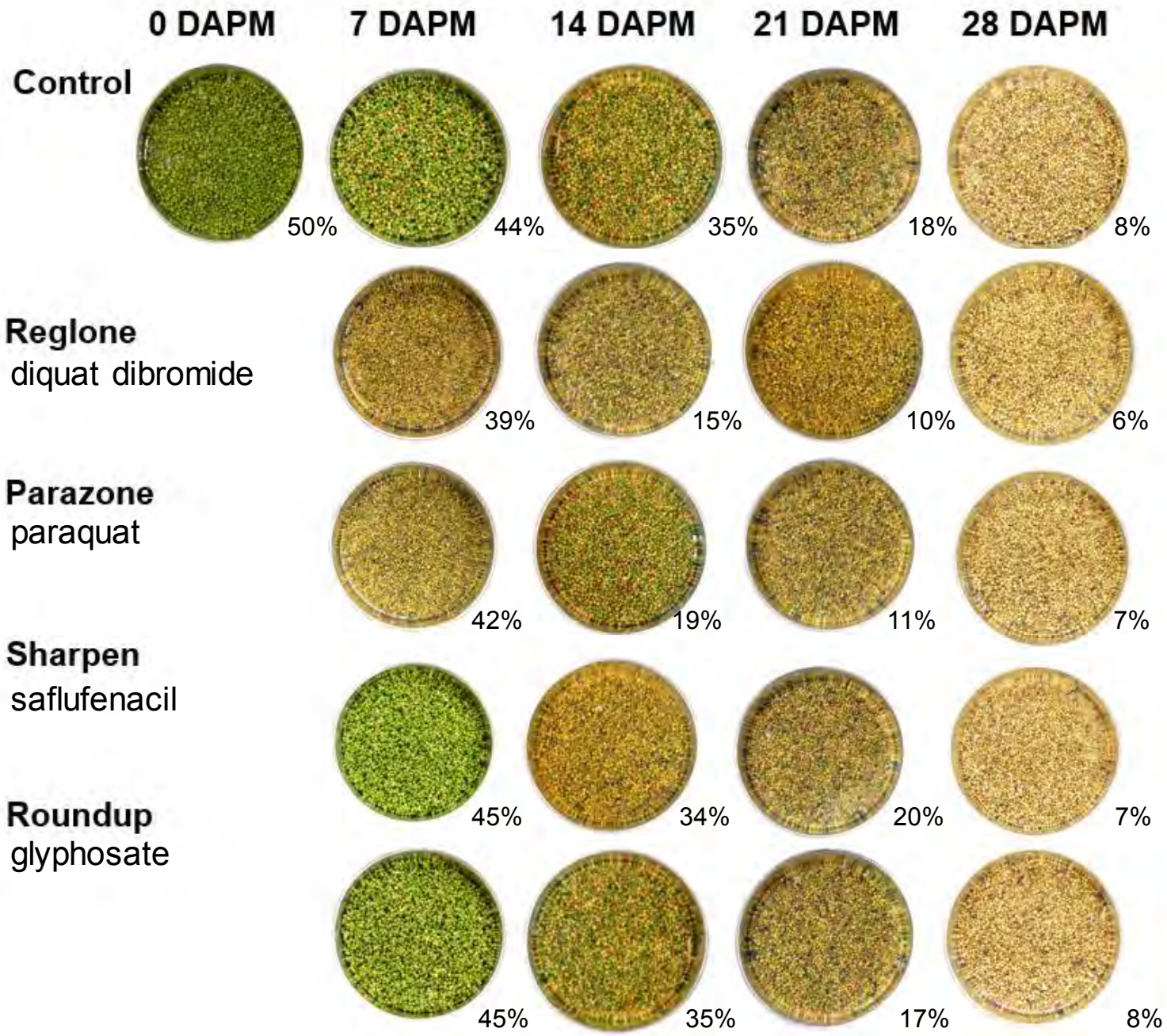
Pods are yellow to light brown
Seeds are light yellow
Stems are light green

Pods are light green to yellow
Seeds are green to light yellow

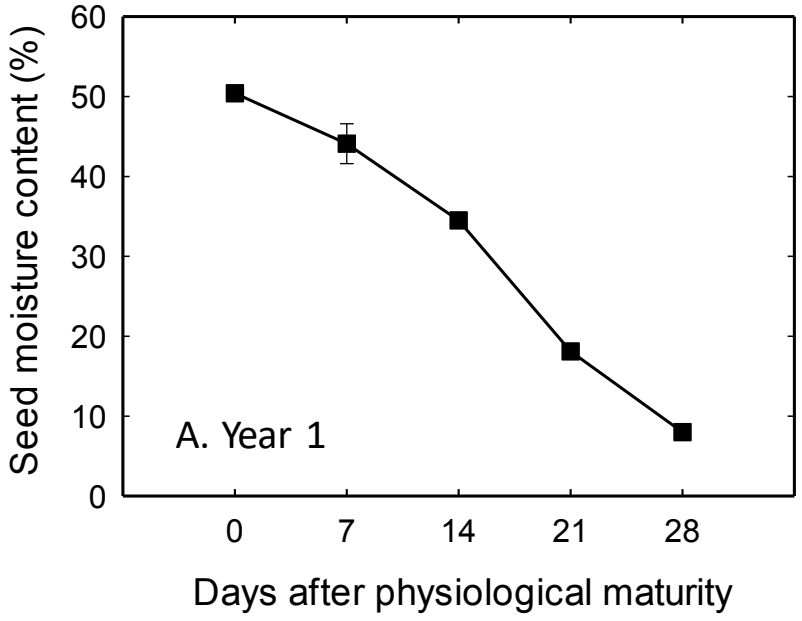
- The crop must be physiologically mature before harvest aids are applied.
- Carinata seed is physiologically mature when the seed color changes from green to light green.
- A harvest aid can be applied when >70% of the seeds are physiologically mature. At this time, the upper branches and pods will be brown, however, the main stem may remain slightly green.

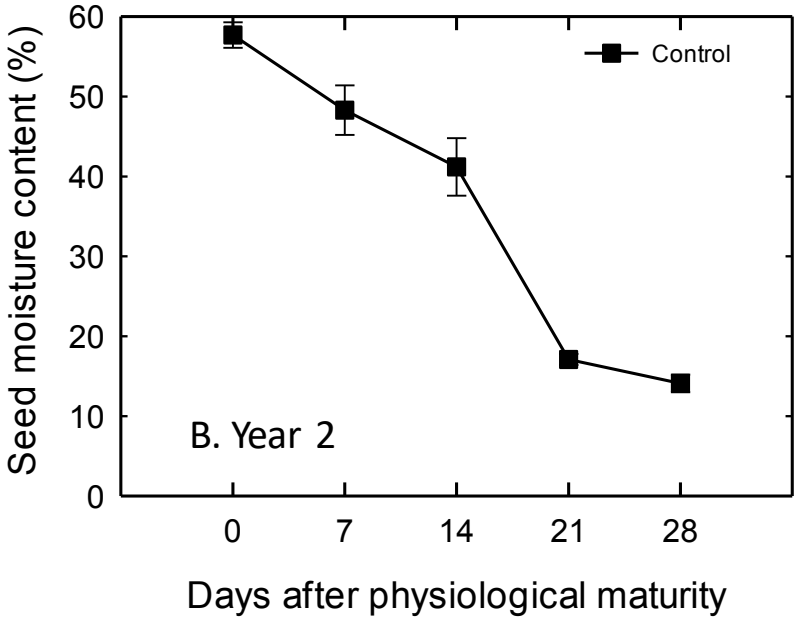
Systemic vs. Contact Desiccants

- Harvest aid
  - two contact desiccants:
    diquat dibromide (Reglone) and paraquat (Parazone)
  - two Systemic desiccants:
    saflufenacil (Sharpen) and glyphosate (Roundup)
- Application rate
  - 1X and 2X the label rate
- Application timing
  - 7, 14, 21, and 28 days post physiological maturity (DAPM)
- Responses: seed, stem, pod moisture, yield, seed quality


0 DAPM
7 DAPM
14 DAPM
21 DAPM
28 DAPM
Control
50%
44%
35%
18%
8%
Reglone
diquat dibromide
39%
15%
10%
6%
Parazone
paraquat
42%
19%
11%
7%
Sharpen
saflufenacil
45%
34%
20%
7%
Roundup
glyphosate
45%
35%
17%
8%

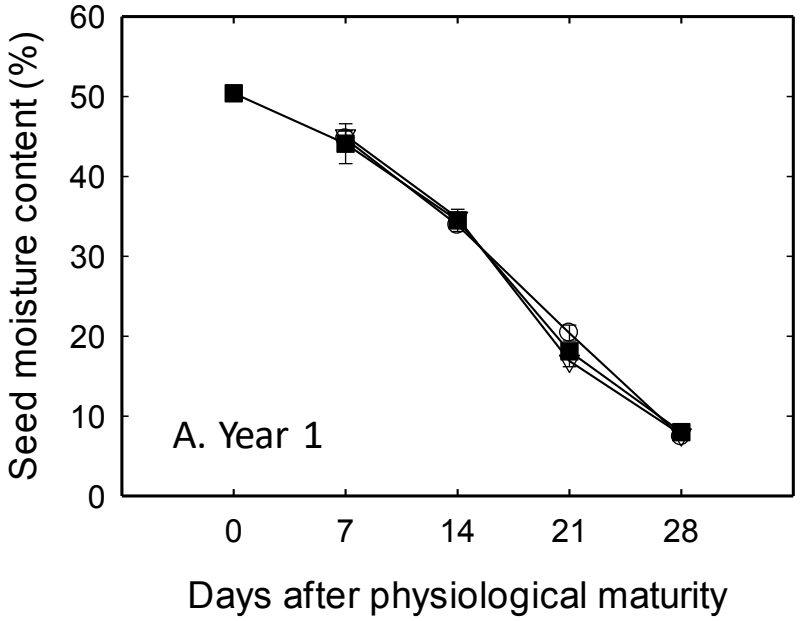
Seed moisture content of non-treated carinata

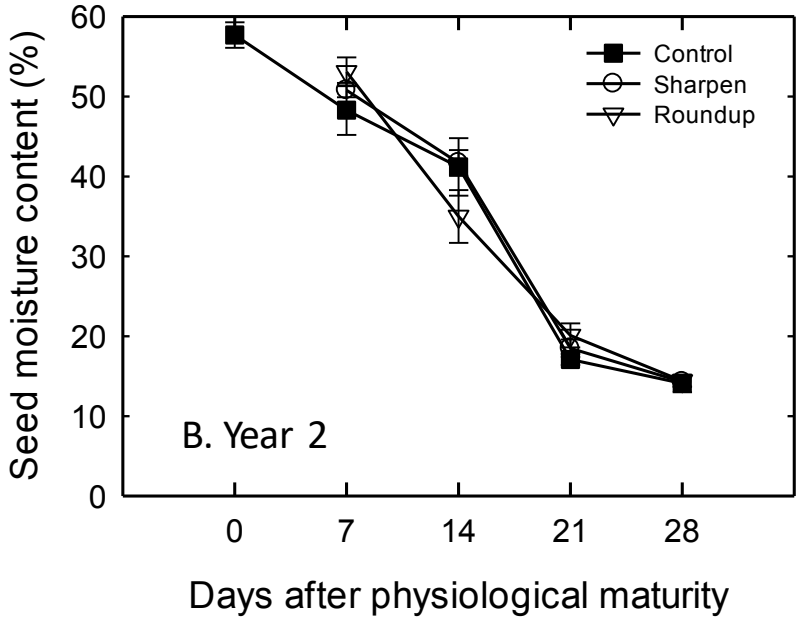




- For commercial delivery, carinata has to be 10% seed moisture.
- In Year 1, seed moisture (SM) reduced from 50 to 8% while in Year 2, SM declined from 58 to 14% during the 28 day dry down period

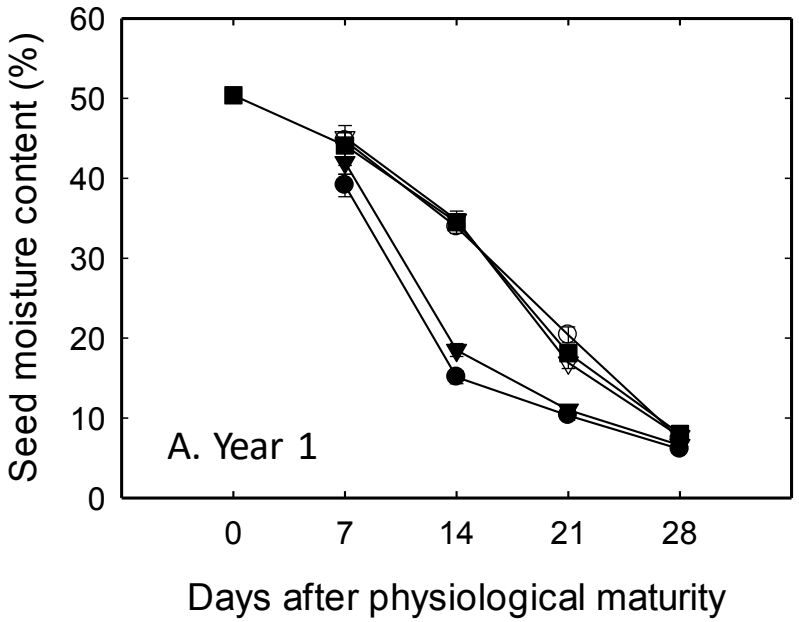
Seed moisture 1 week after systemic HA application

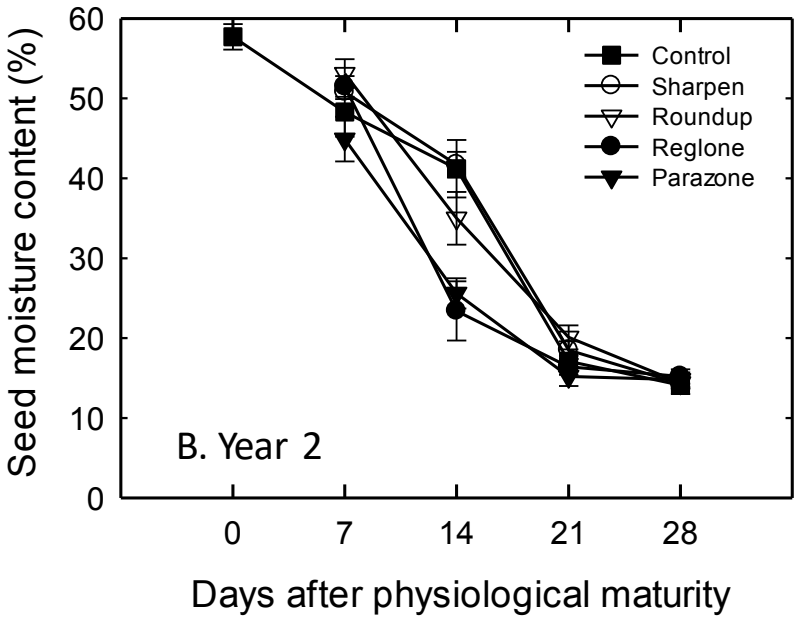




- Seed moisture of carinata treated with systemic HA was similar to nontreated carinata in both years
- Systemic HA may require longer periods of activity to effectively reduce seed moisture

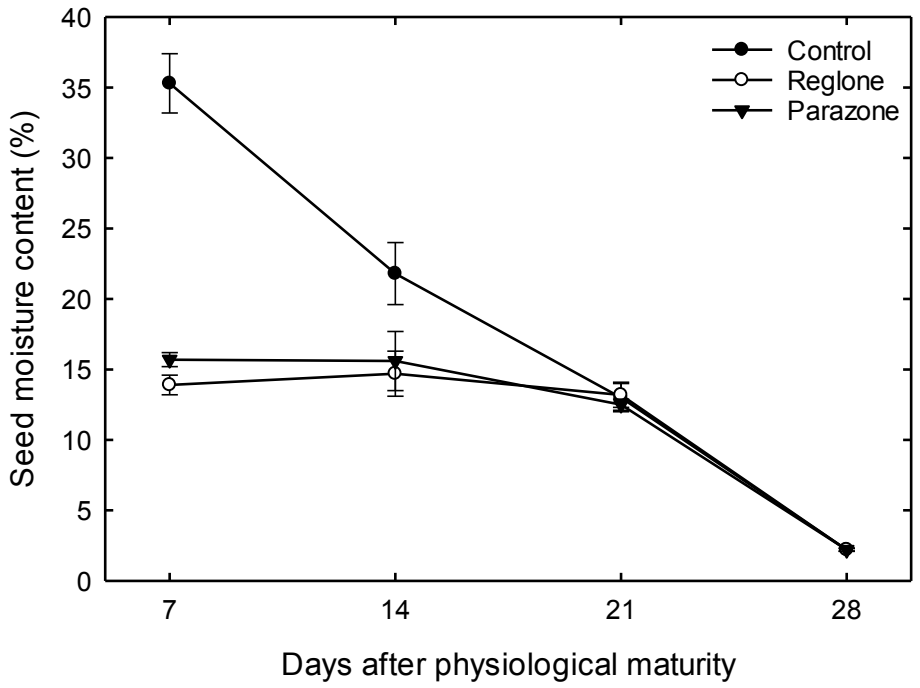
Seed moisture 1 week after contact HA application

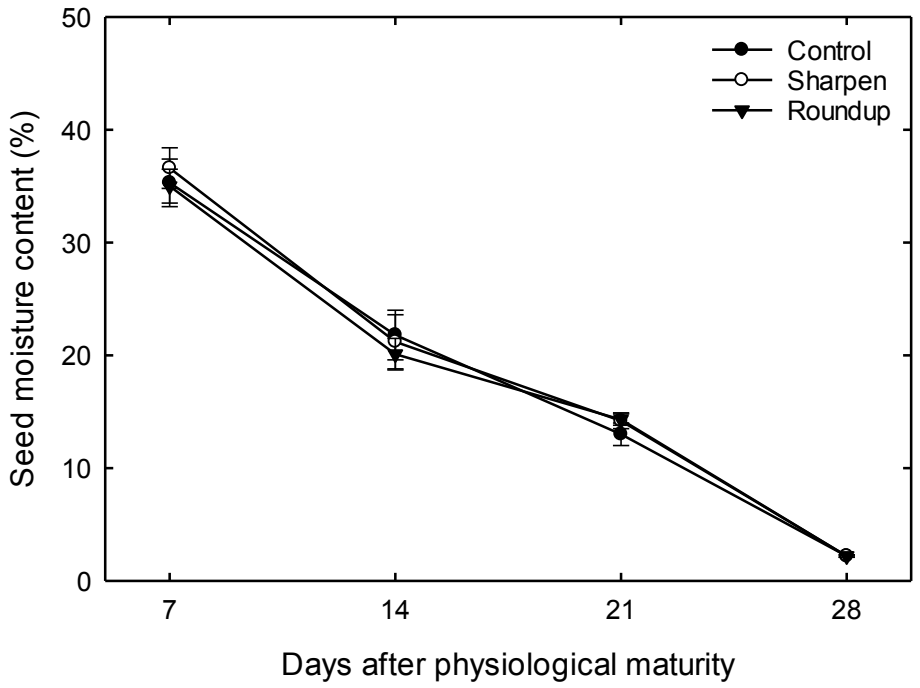




- Relative to the control, Reglone and Parazone reduced seed moisture at 7, 14, and 21 DAPM in Year 1 but only at 14 DAPM in Year 2
- At 14 DAPM, SM was 18 and 17 percentage points lower than control in Years 1 and 2
- At 28 DAPM, SM was similar regardless of harvest aid in both years
- Stems treated with contact HA were drier than control or systemic HA treated carinata, may improve harvest ease.
- Similar to systemic HA, application of contact HA may require longer duration to be effectively reduce SM to <10%.

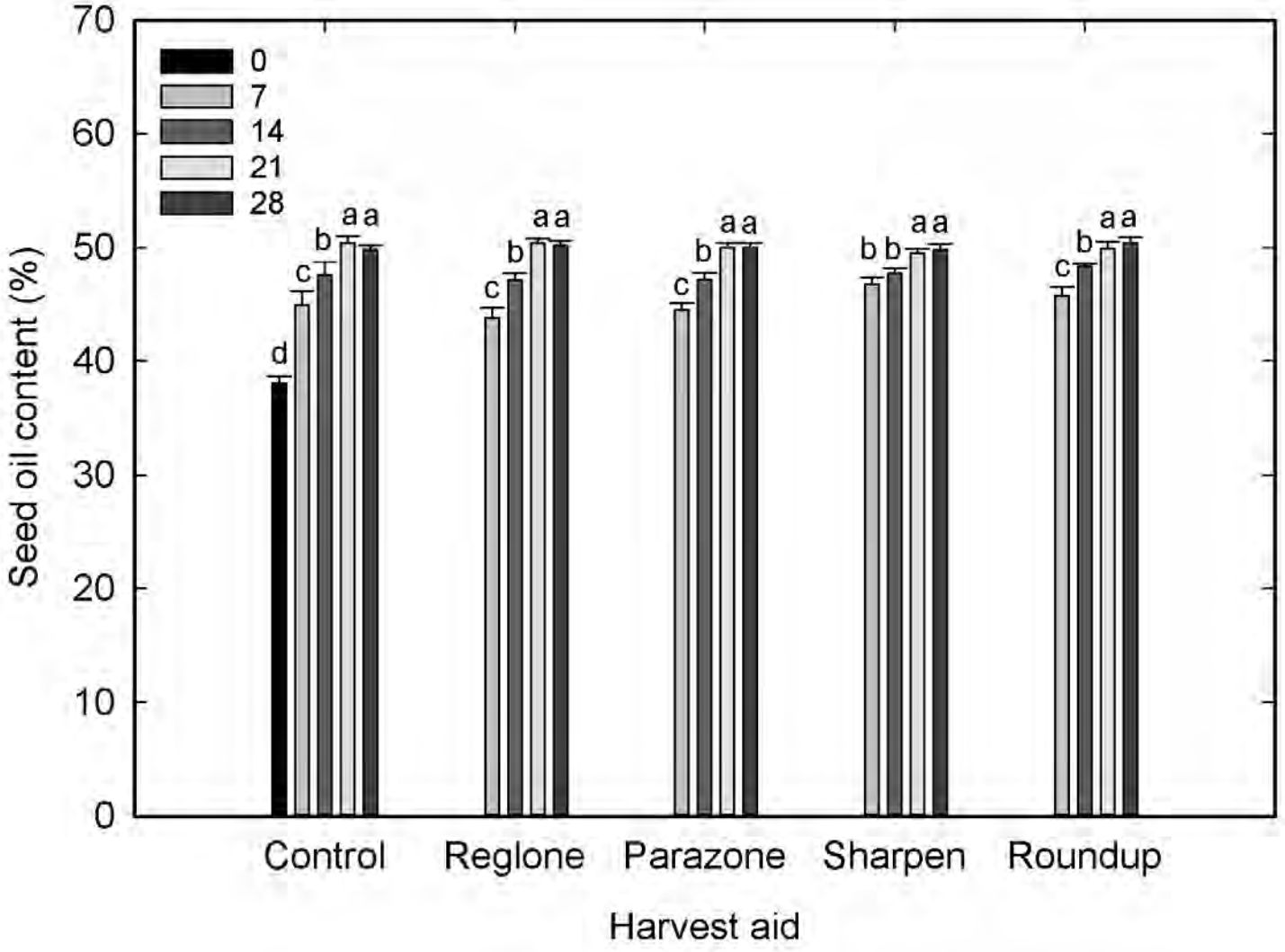
Seed moisture 2 weeks after systemic HA application





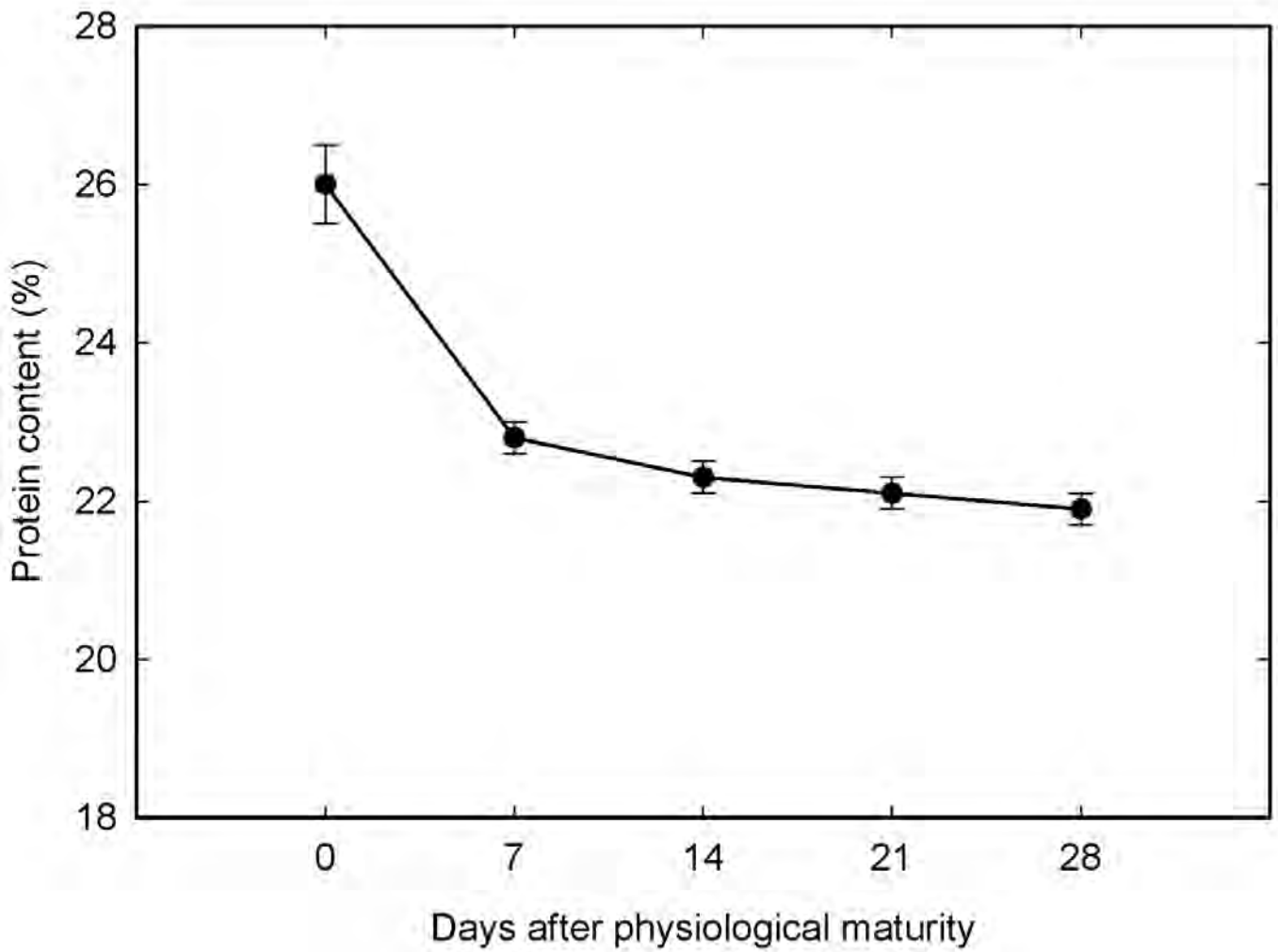
- Two weeks after application, contact HA reduced SM at 7 and 14 DAPM. At 21 DAPM and beyond, SM was similar to the control
- Systemic HA did not have an effect on SM content 2 weeks after application.

Carinata oil content on whole seed basis



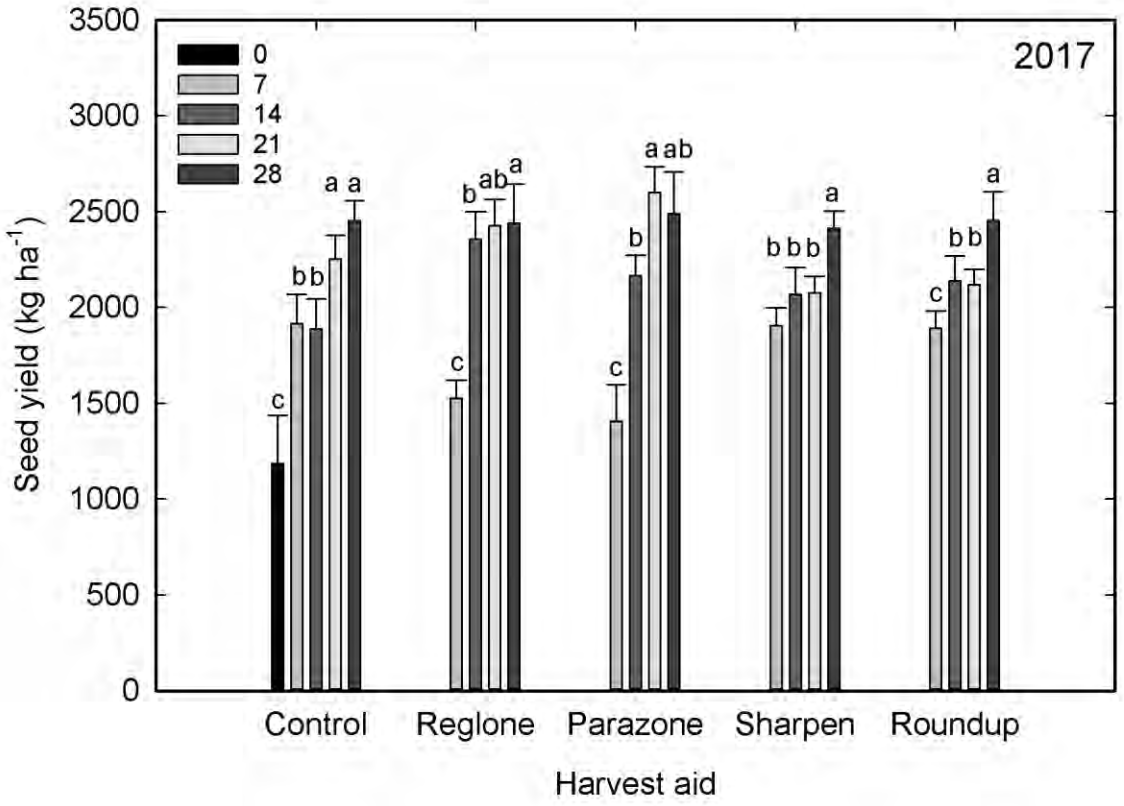
- 12.3 percentage point increase in oil from 0 to 21 DAPM in non-treated carinata
- Maximum oil content occurred 21 DAPM regardless of harvest aid

Carinata protein content on whole seed basis

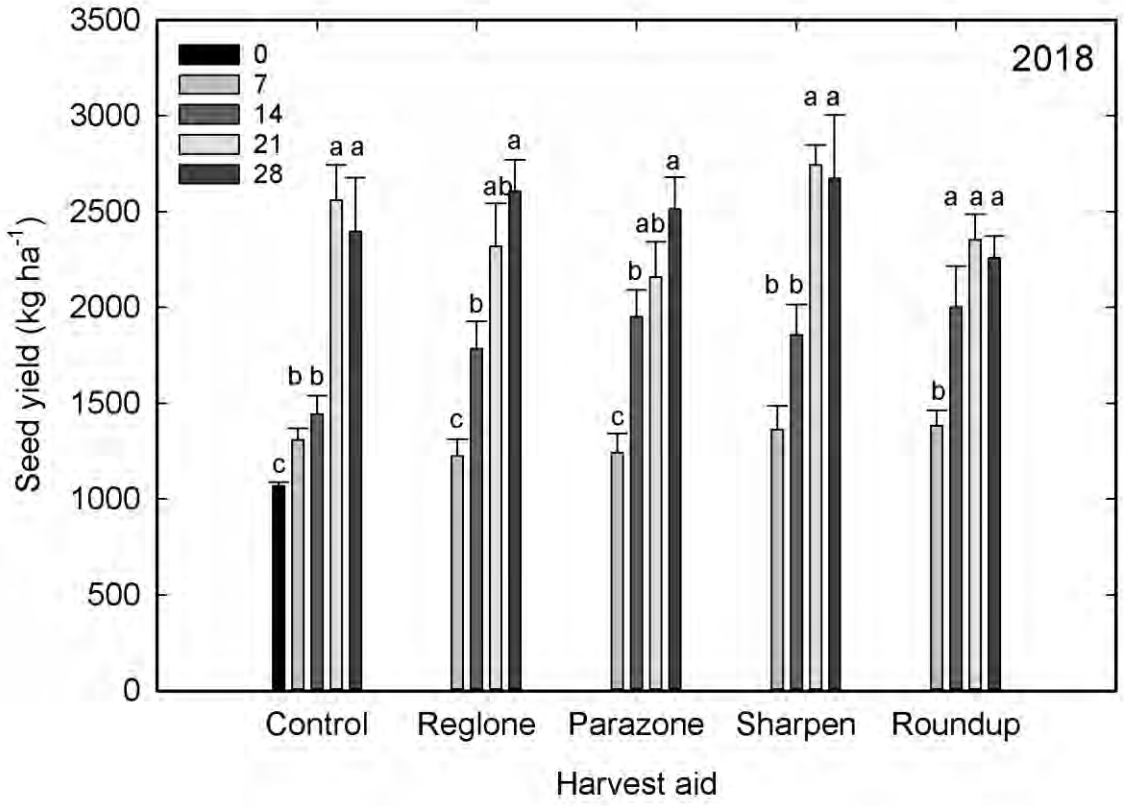


- Protein varied only with sampling time and not harvest aid, rate or source
- Protein is inversely related to oil content
- Protein was similar (22%) at 14, 21 and 28 DAPM

Harvest aid effects on carinata seed yield



- 90% increase in yield from 0 to 21 DAPM
- Contact HA did not reduce yield at 21 and 28 DAPM
- At 21 DAPM, systemic HA reduced yield by 16%. Yields were similar to control at 28 DAPM



- 139% increase in yield from 0 to 21 DAPM
- 10 and 18% yield loss with Reglone and Parazone at 21 DAPM, respectively
- Systemic HA did not have an effect on yield at 21 or 28 DAPM

Refining Harvest Aid Recommendations

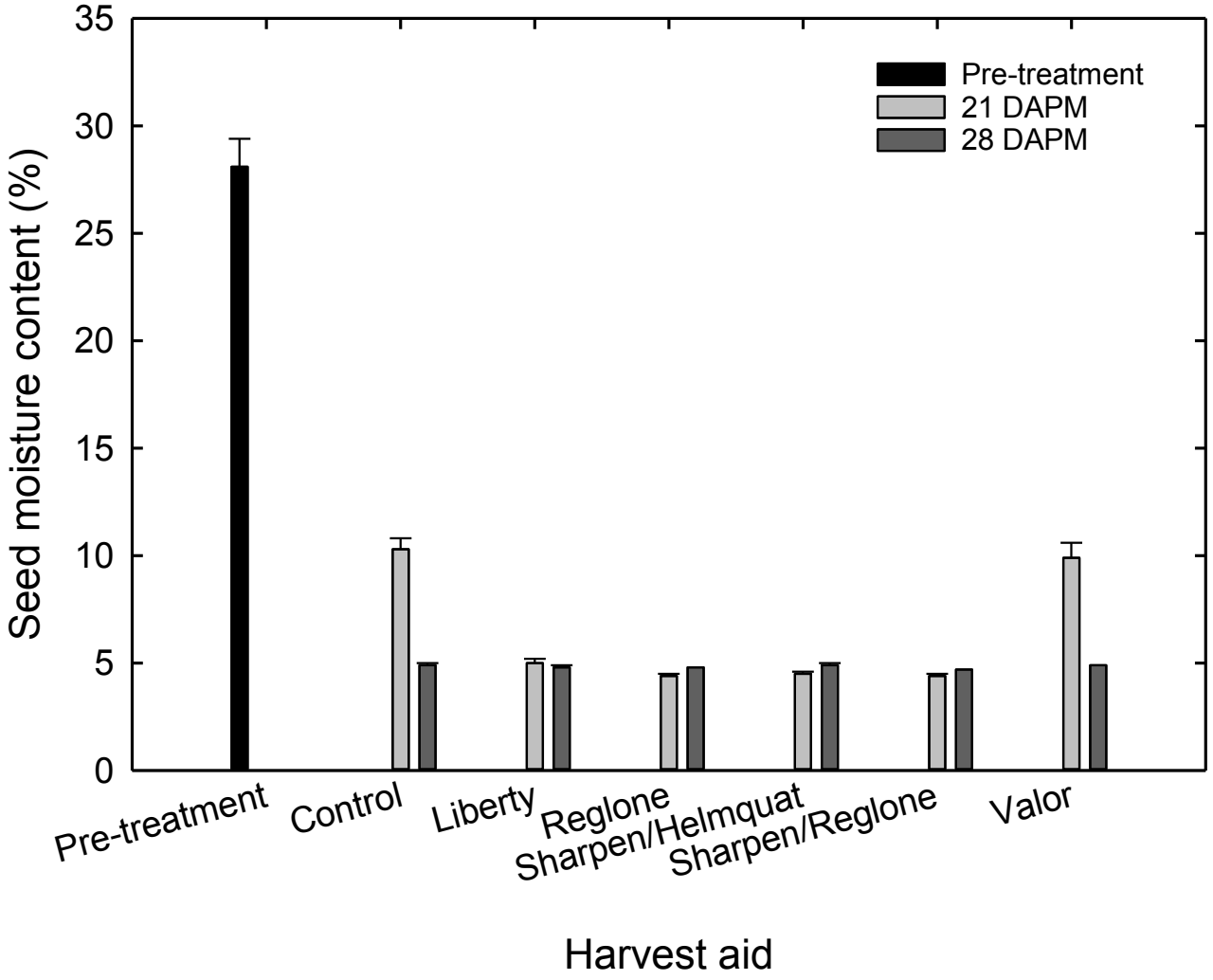
- Desiccants:
  i. Diquat Dibromide (Reglone) – 24 oz/ac (contact)
  ii. Flumioxazin (Valor) – 4 oz/ac (contact)
  iii. Glufosinate (Liberty) – 29 oz/ac (contact)
  iv. Saflufenacil/Diquat (Sharpen/Reglone) – 1.5/24 oz/ac
  v. Saflufenacil/Paraquat (Sharpen/Helmquat) 1.5/1.6 oz/ac

- Days after physiological maturity: 21 (133 DAP) and 28 (140 DAP)


21 DAPM
Control
Stem: 57% MC
Pod: 22% MC
Seed: 10% MC
Reglone
Stem: 28% MC
Pod: 7% MC
Seed: 5% MC


28 DAPM
Control
Stem: 38% MC
Pod: 10% MC
Seed: 5% MC
Reglone
Stem: 23% MC
Pod: 9.5% MC
Seed: 5% MC

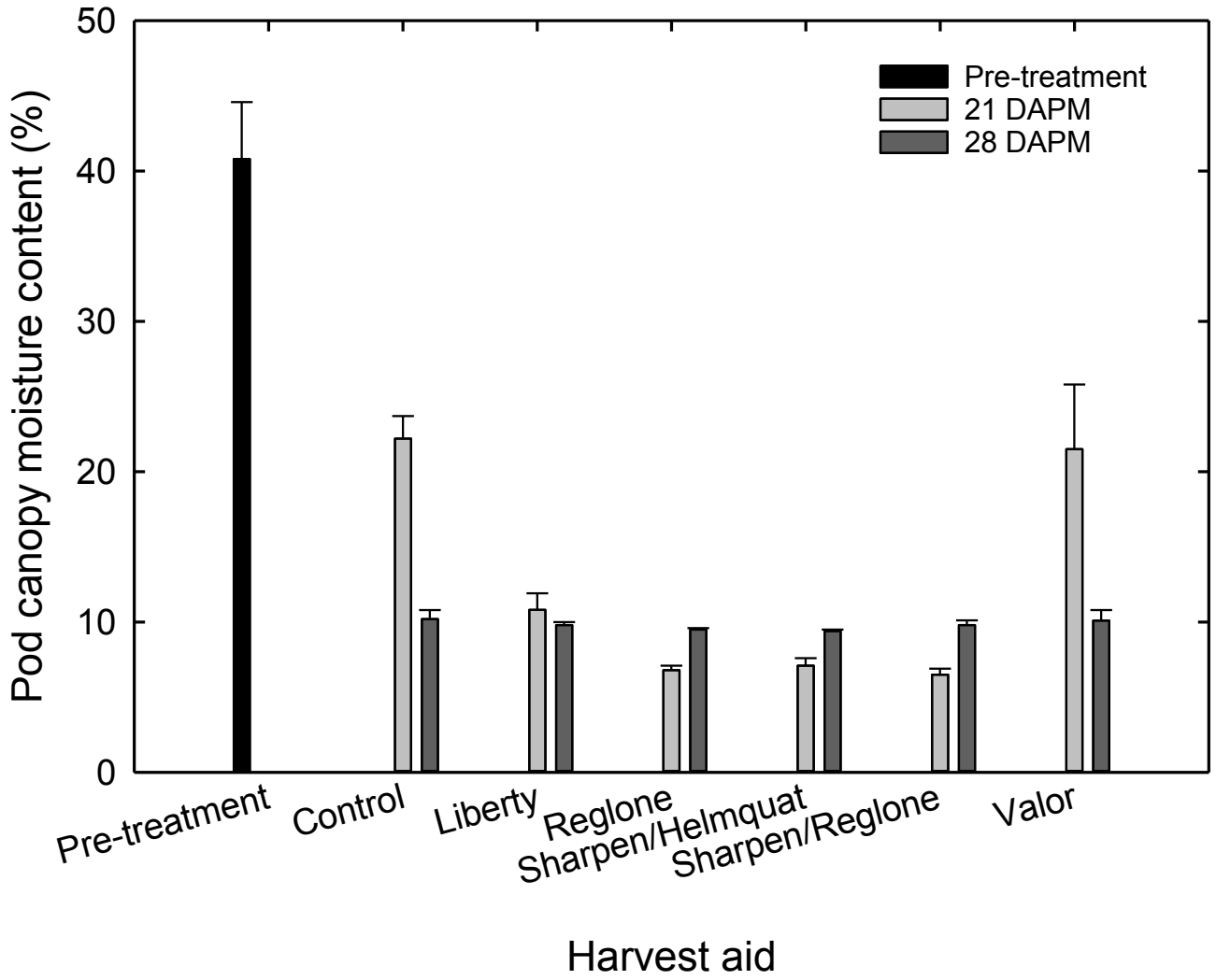
Reduction in seed moisture



Efficacy of desiccants in reducing seed moisture content relative to control (percentage points)

Chemical	21 DAPM	28 DAPM
Liberty	5	ns
Reglone	6	ns
Sharpen/Helmquat	6	ns
Sharpen/Reglone	6	ns
Valor	ns	ns

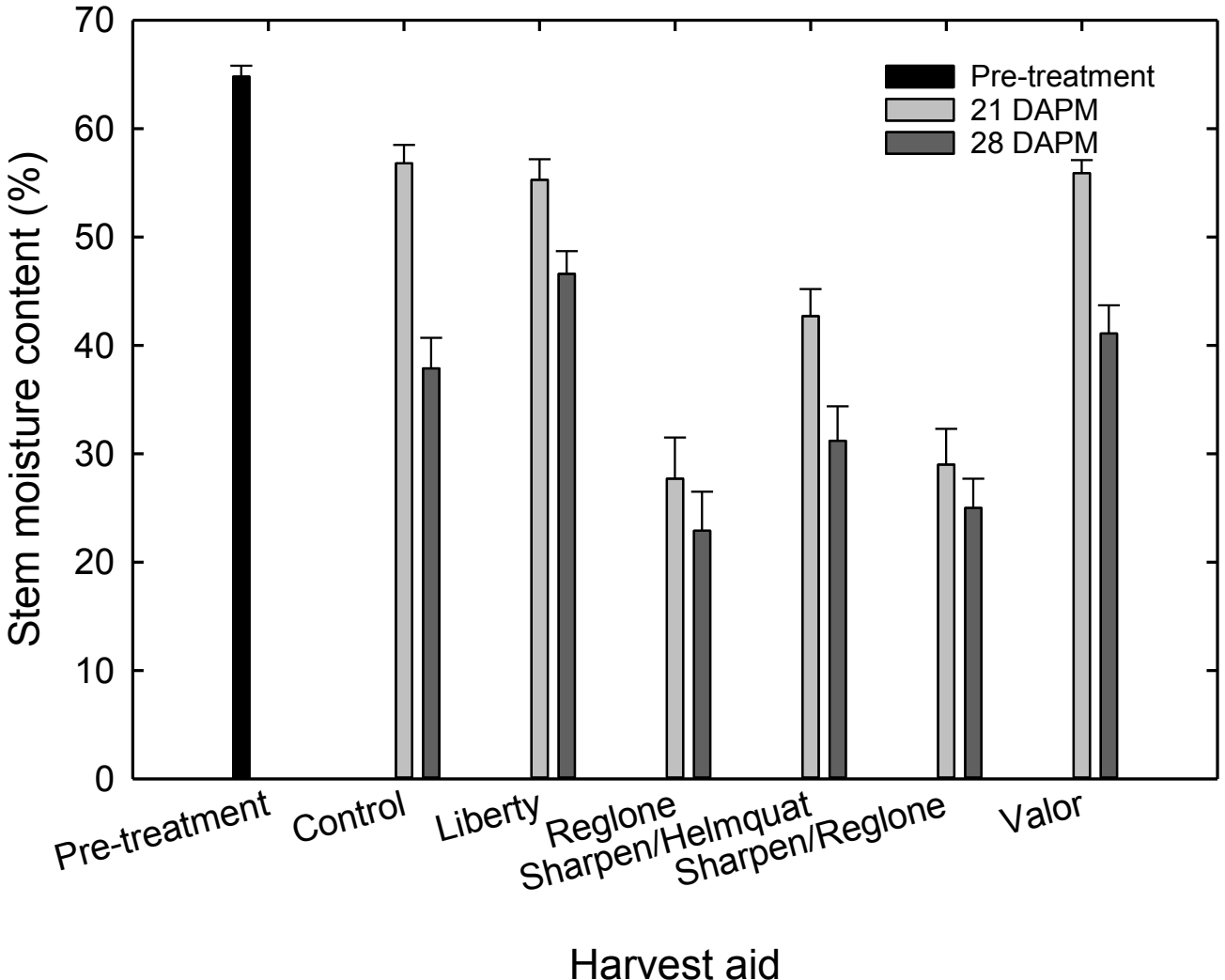
Reduction in pod canopy moisture



Efficacy of desiccants in reducing pod moisture content relative to control (percentage points)

Chemical	21 DAPM	28 DAPM
Liberty	11	ns
Reglone	15	ns
Sharpen/Helmquat	15	ns
Sharpen/Reglone	16	ns
Valor	ns	ns

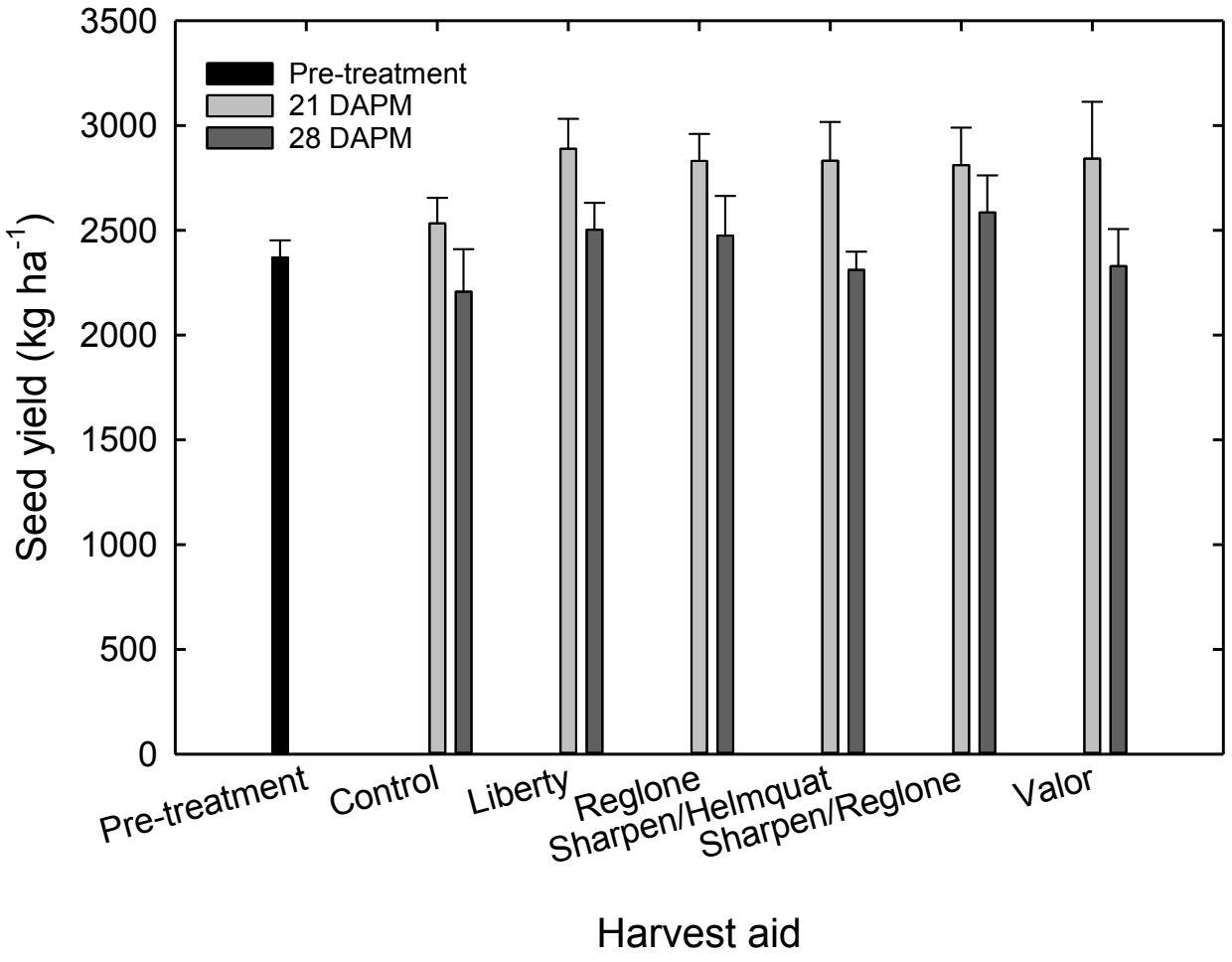
Reduction in stem moisture



Efficacy of desiccants in reducing stem moisture content relative to control (percentage points)

Chemical	21 DAPM	28 DAPM
Liberty	ns	ns
Reglone	29	15
Sharpen/Helmquat	14	7
Sharpen/Reglone	28	13
Valor	ns	ns

Seed yield



- Yield averaged 2842 and 2441 kg ha^{-1} at 21 and 28 DAPM respectively
- 16% yield reduction at 28 DAPM related to higher shattering loss at harvest

How to minimise harvest losses?

- Application timing of harvest aid should be optimized to minimize loss of seed yield
- The weather forecast and condition of the crop are important factors to consider when applying harvest aids
- Harvest aids will need about 7 - 10 days to be effective. Plan on harvesting as soon as the seed moisture is 10% or less. Seeds will deteriorate if allowed several cycles of wetting and drying
- Use the machine settings for rapeseed outlined in the operator's manual. Settings will have to be adjusted and fine-tuned depending on crop moisture and harvest conditions. It is essential to have the proper screens and combine settings to reduce dockage and loss of seed
- Check periodically for seed loss behind the combine and adjust settings if necessary for optimized harvest

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