EFFECTS OF FOUR HERBICIDES ON THE SURVIVAL AND GROWTH OF NATIVE PERENNIAL GRASSES

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IRVINE RANCH CONSERVANCY

ORANGE COUNTY REGIONAL SETTING

THE PROBLEM

- Restoration and management of native grasslands is complicated by competition with aggressive annual forbs and grasses
- Manual weed control over large acreage is not possible

THE SOLUTION..?

- Use selective herbicides
- Use a low dose that only kills emerging annuals but leaves perennials

PAST RESEARCH

- Mature purple needlegrass can survive broadcast glyphosate application (Bell et al., 2008; Young and Claassen 2008)
- Both broadleaf herbicide and glyphosate treatment can increase native cover (Young and Claassen 2008)
- Low-dose glyphosate can selectively kill annual grasses, favoring perennials. (Carl Bell and others)
- Broad-leaf selective herbicides can take out annual forbs, favoring perennial grasses (Young and Claassen 2008).

QUESTION

- Do low-dose broad-leaf herbicides affect young native perennial grasses?

- What direct native grass mortality can we expect with broad spectrum and grass specific herbicides?

METHODS

THREE GRASS SPECIES

California Brome (*Bromus carinatus*)

Purple Needlegrass (*Nasella pulchra*)

Blue Wild Rye (*Elymus glaucus*)

FOUR HERBICIDES

Herbicide	Active Ingredient	Treatment Strength
Fusilade II	Fluazifop-P-butyl	0.2% (<1 pt/ac)
Element 4	Triclopyr ester	0.4% (<1qt/ac)
Milestone VM+	(Triclopyr, triethylamine salt + Aminopyralid)	0.1% (2.5oz/ac)
RoundUp ProMax	Glyphosate	0.4% (<1qt/ac)
Control	N/A	N/A

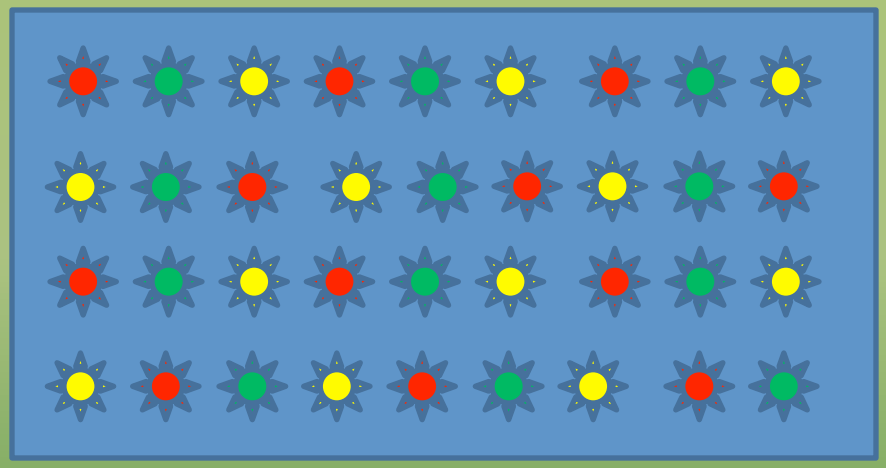
TWO AGES

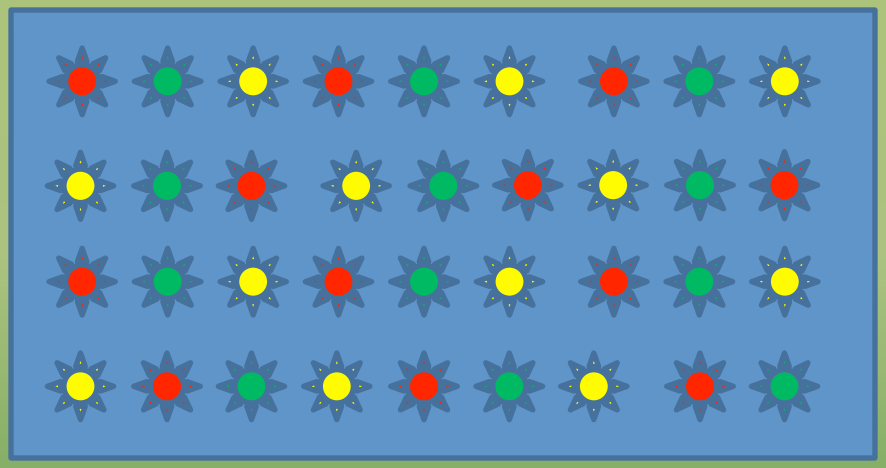
FOUR HERBICIDES

THREE GRASS SPECIES

N = 24 per species per treatment
360 plants total per trial
720 plants total

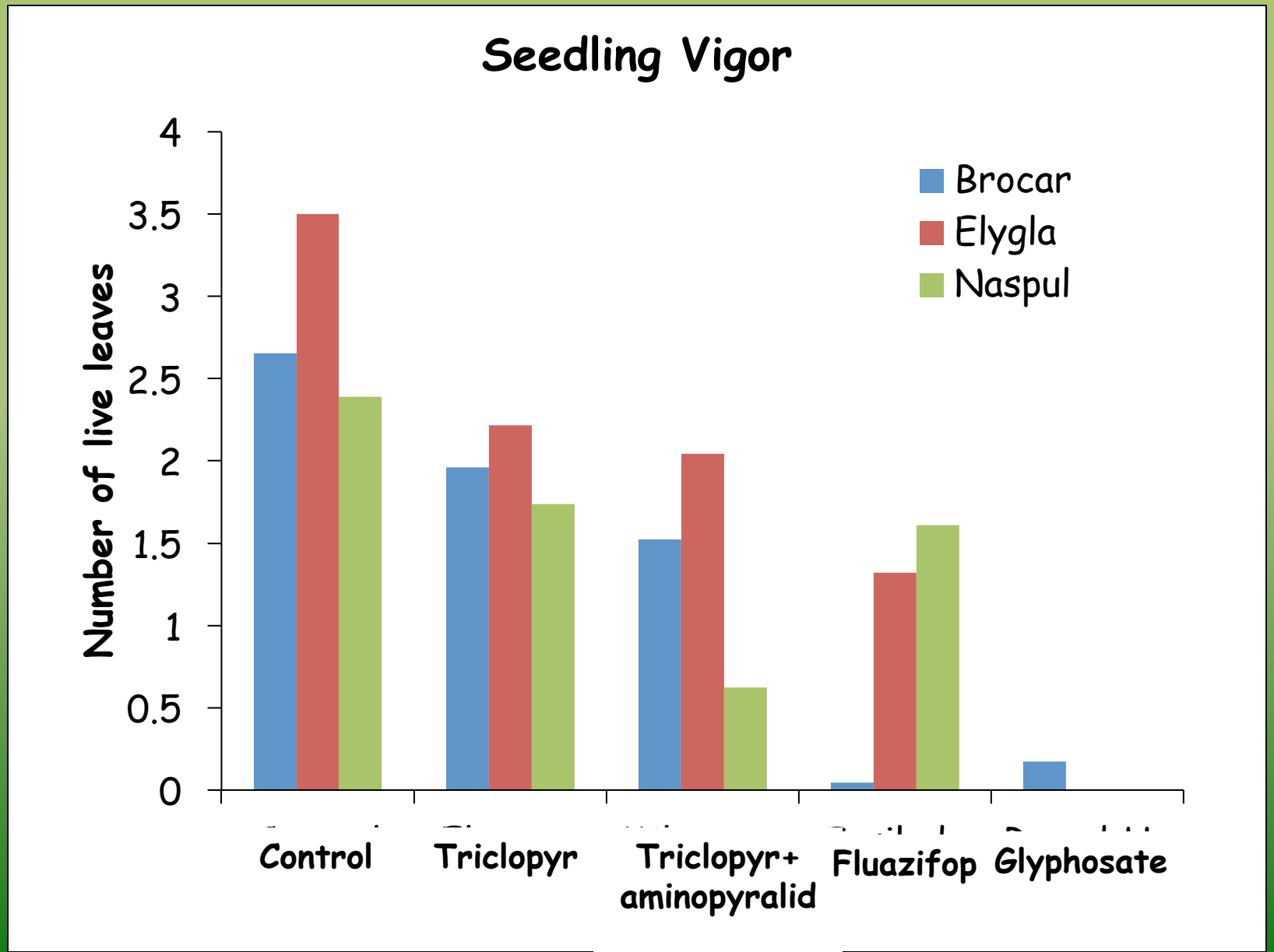
BLOCKS





RESULTS

YOUNG SEEDLINGS



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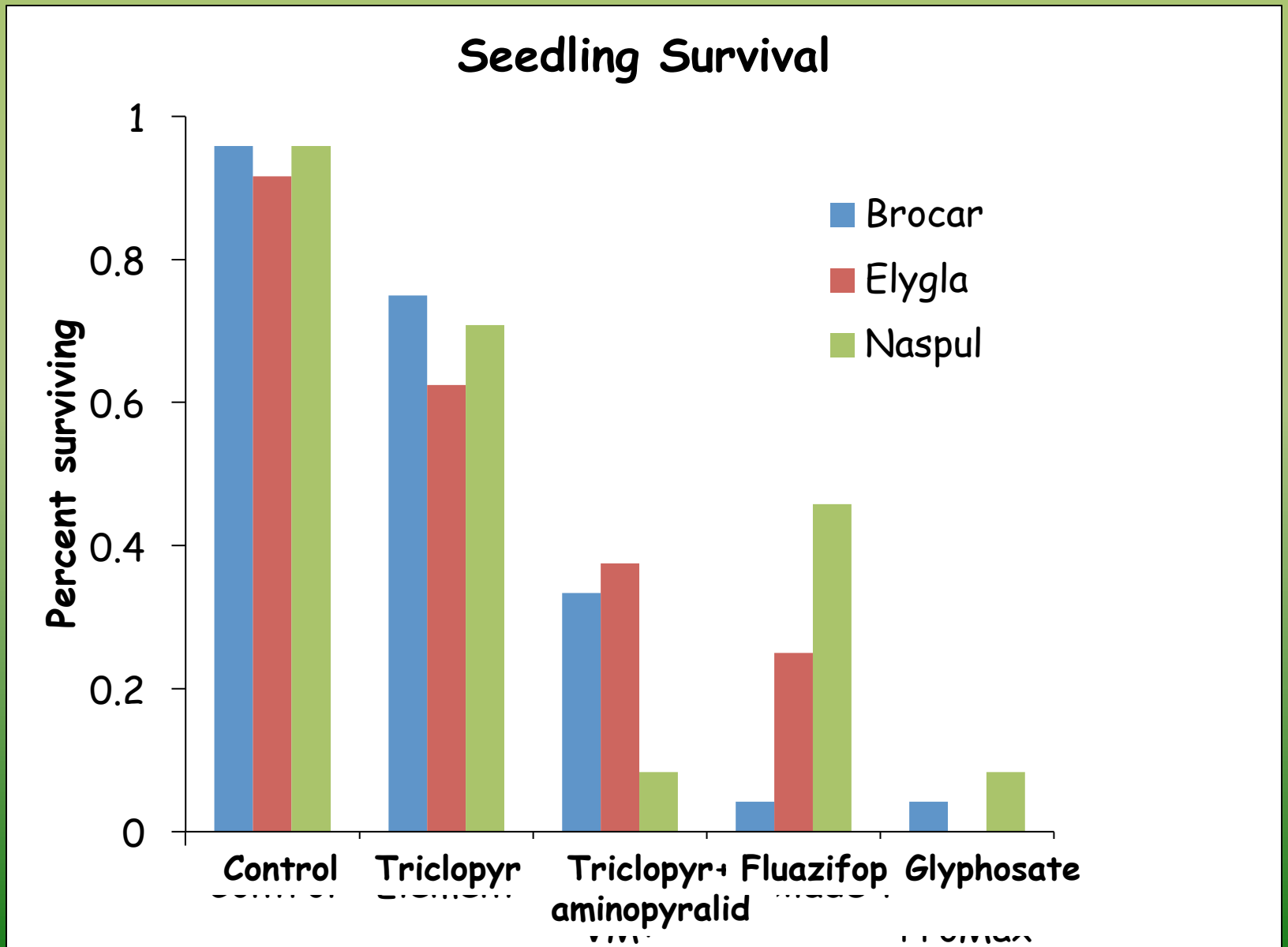
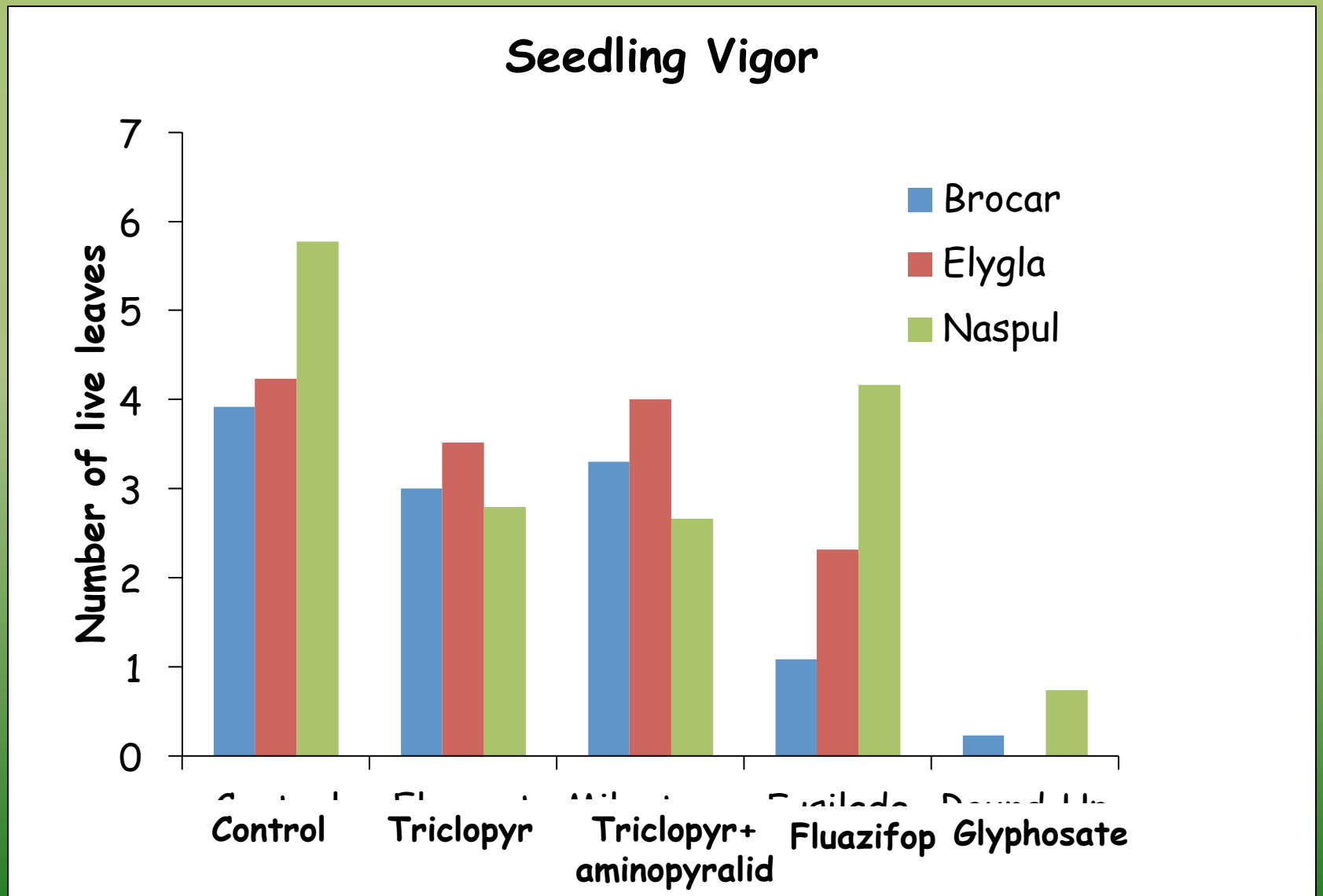
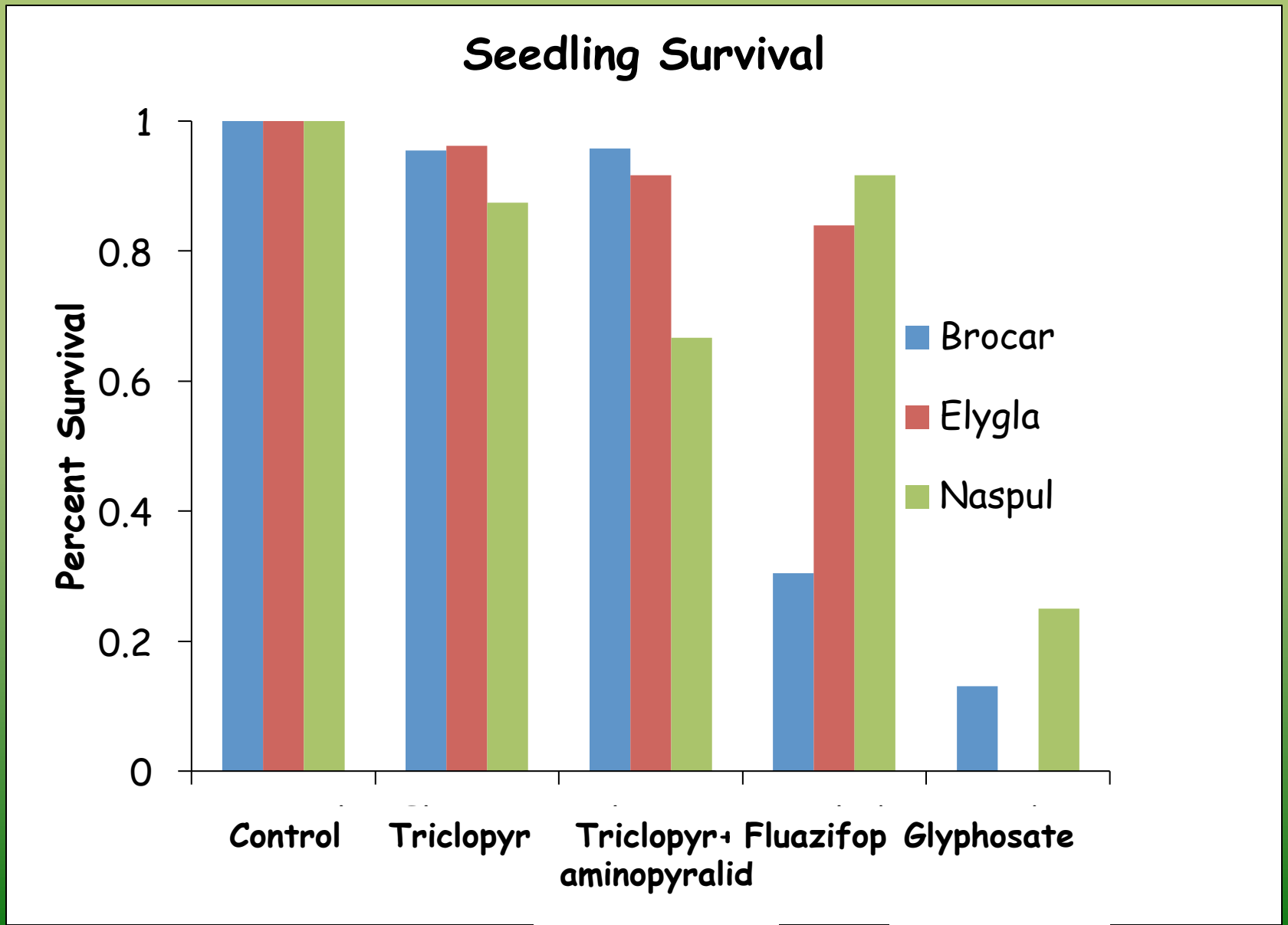


OLDER SEEDLINGS



OLDER SEEDLINGS



Results …

- Low dose Triclopr and Triclopyr/Aminopyralid both harm perennial grasses.
- Though doses were not equivalent, Triclopyr/ aminopyralid damaged grasses more than pure Triclopyr.
- Survival increased with age of seedling. A few weeks made a big difference.
- Purple Needlegrass was more sensitive to Triclopyr/ Aminopyralid than blue wild rye or Cal. brome.

Conclusions

- Low dose broad-leaf Triclopyr herbicides can injure native perennial grasses.
- Triclopyr/Aminopyralid may harm grasses more than pure Triclopyr.
- Perennial grass seedlings can survive low-dose Fluazifop.
- Younger seedlings are much more sensitive to herbicide effects.

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