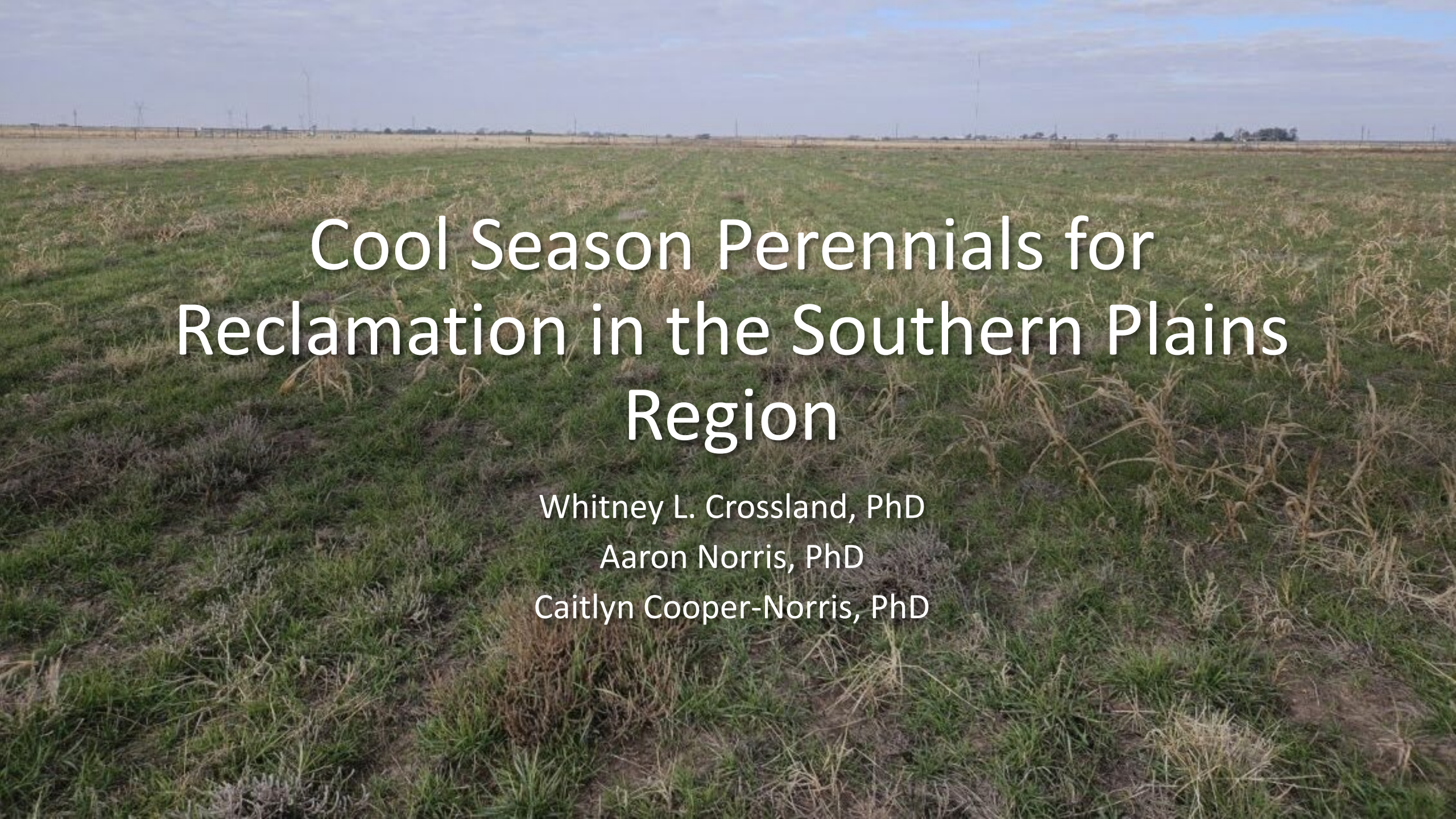


Cool Season Perennials for Reclamation in the Southern Plains Region

Whitney L. Crossland, PhD
Aaron Norris, PhD
Caitlyn Cooper-Norris, PhD

The grazing gap

Nov - April

Low abundance of native perennial cool season forages

Spring calving cow herds

Tradition

- Plant annuals
- Buy hay

- Long term consequences
  - Soil infertility & erosion
  - High inputs

Forage Species

Mediterranean/ semi-summer dormant varieties

Gala grazing brome (*Bromus stamineus*)

Temora tall fescue (*Lolium arundinaceum*)

Native grass variety

Western wheatgrass (*Pascopyrum smithii*)

Temora tall fescue (*Lolium arundinaceum*)

- endophyte-free
- high productivity/persistence, low rainfall
- deep root system
- Highly palatable
- Ideal for dryland or drip irrigation

Gala grazing brome (*Bromus stamineus*)

- Endophyte free
- Densely tillered, short tillers
- Persistent in overgrazed areas
- Palatable
- Drought avoidant
  - Ideal for dry land

Arriba Western wheatgrass (*Pascopyrum smithii*)

- Courser leaves
- Stronger rhizomes, aggressive sod forming
- Ideal for soil stabilization and erosion control
- Tolerant of saline conditions
- “Palatable”
- Later reproductive stage (July)

Design

TTU New Deal Research Farm

- Two ~2.4-hectare pastures
- ~0.4-hectare subplots

Initial planting Fall 2023

Design

Fall 2023	Spring 2024	Fall 2024	Spring 2025	Fall 2025
☐ Planting	☐ Sampling	☐ Sampling	☐ Sampling	☐ Sampling

- Biomass
- Bare ground
- Grass
- Other species
- Litter
- Forage analysis

Analysis

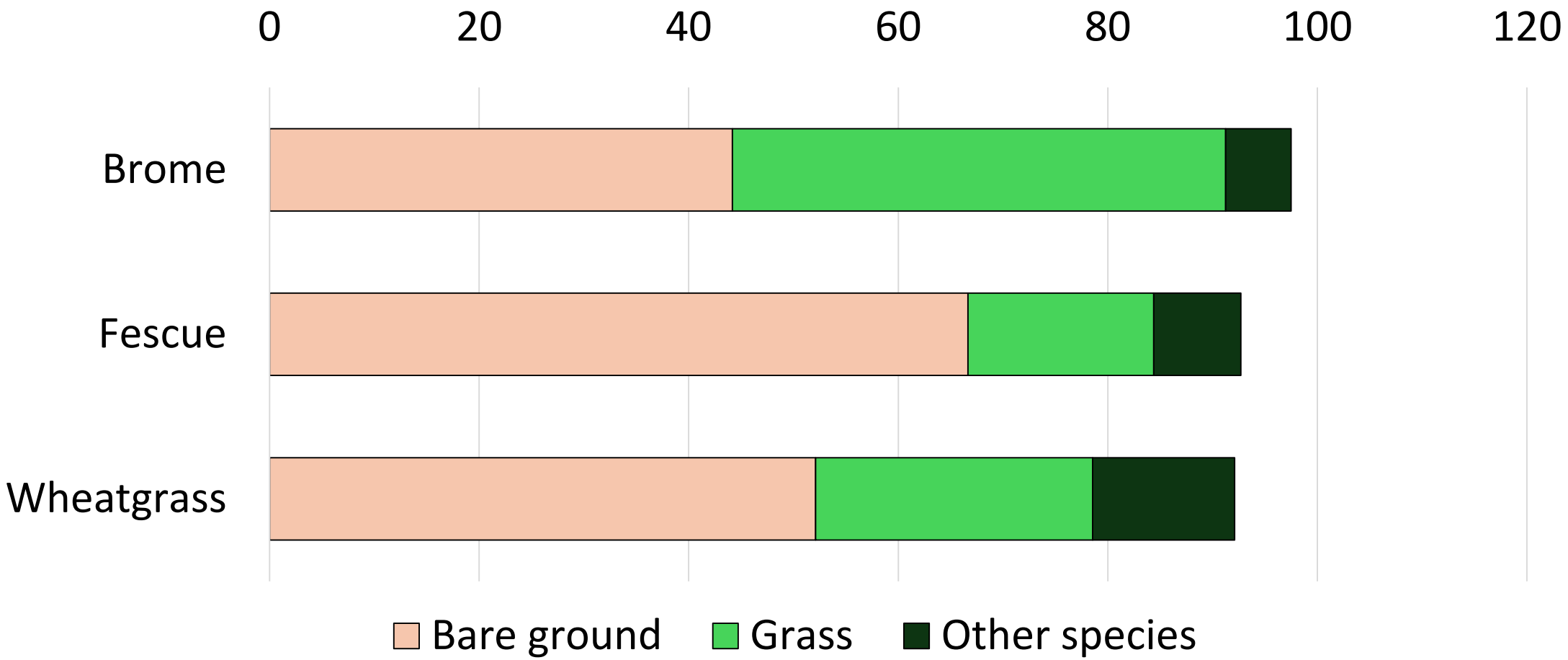
Y = species + paddock + e

Results are within year

Vegetative Results

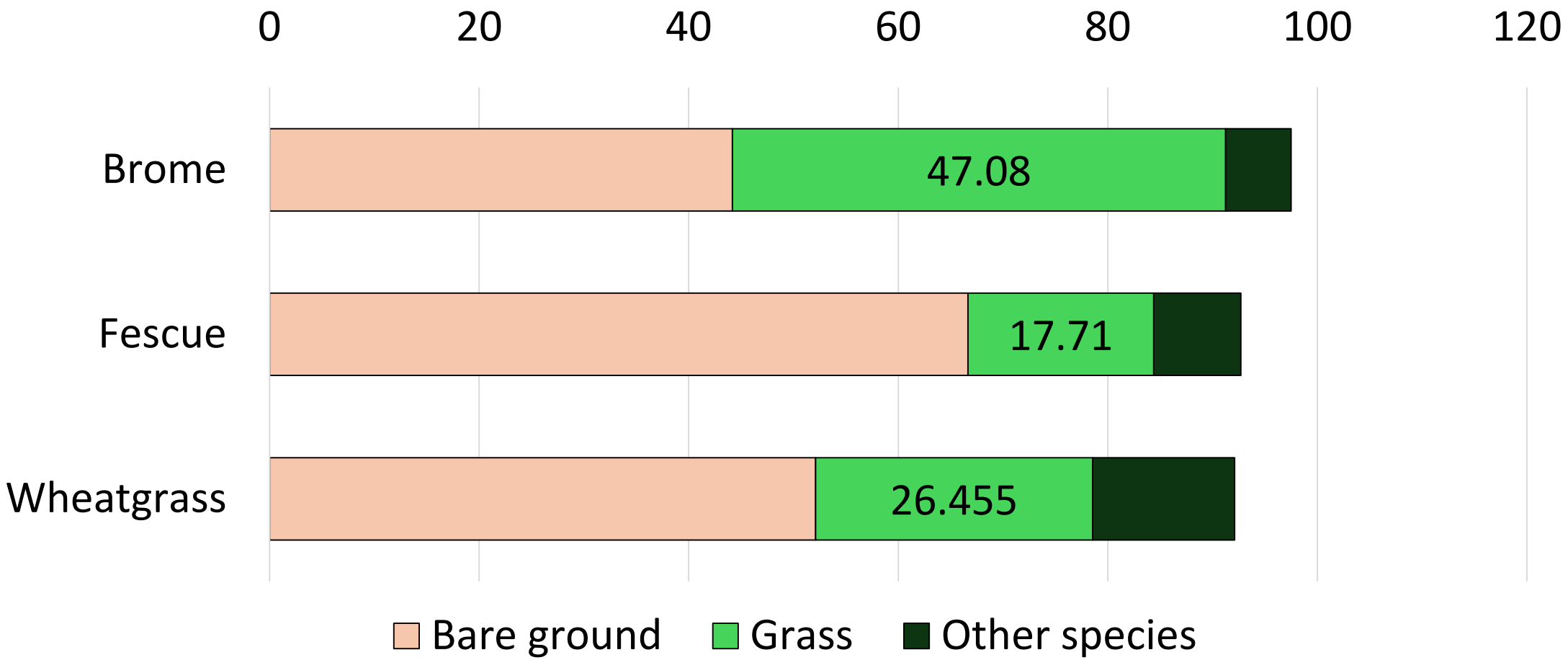
- Bare ground
- Grass
- Other species
- Litter (only applies to year 2)
- Grass:ground
- Grass:weed

Vegetative Results
Year 1



P = 0.0182

Year 1



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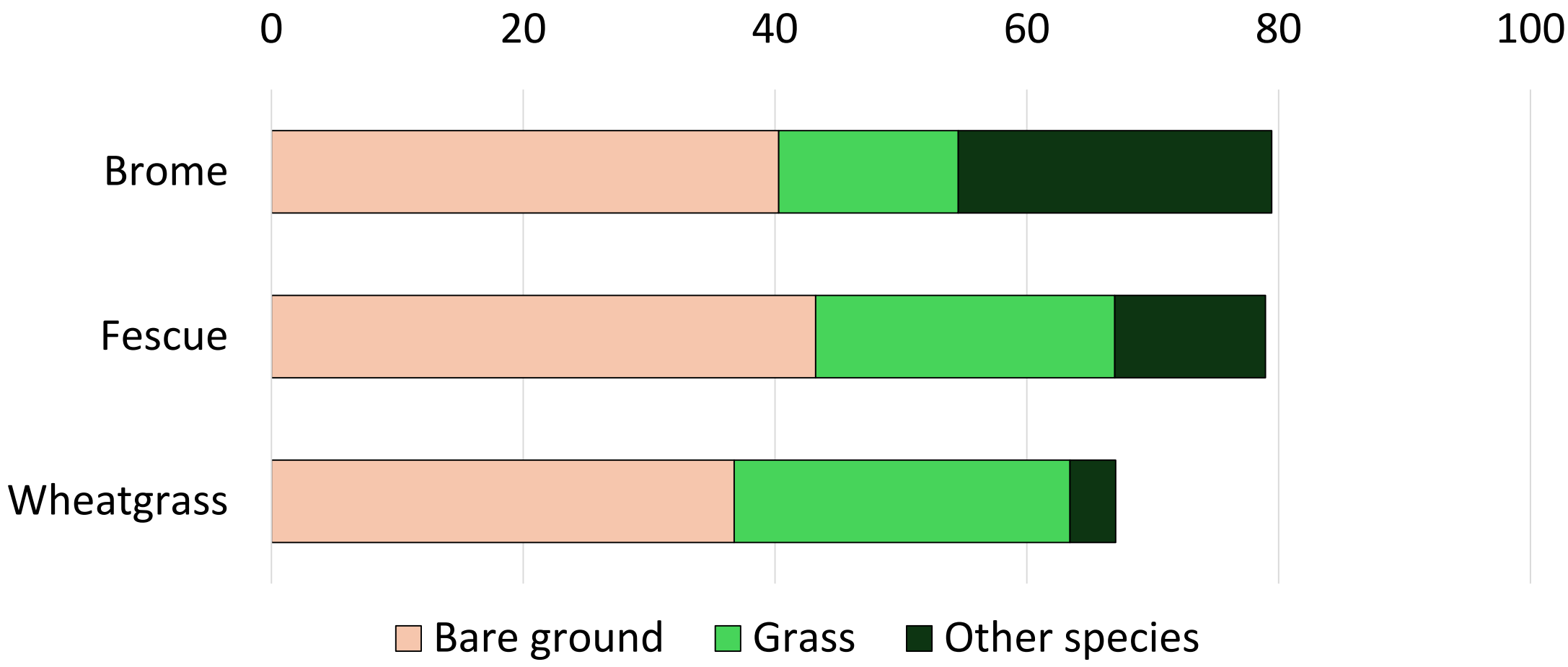
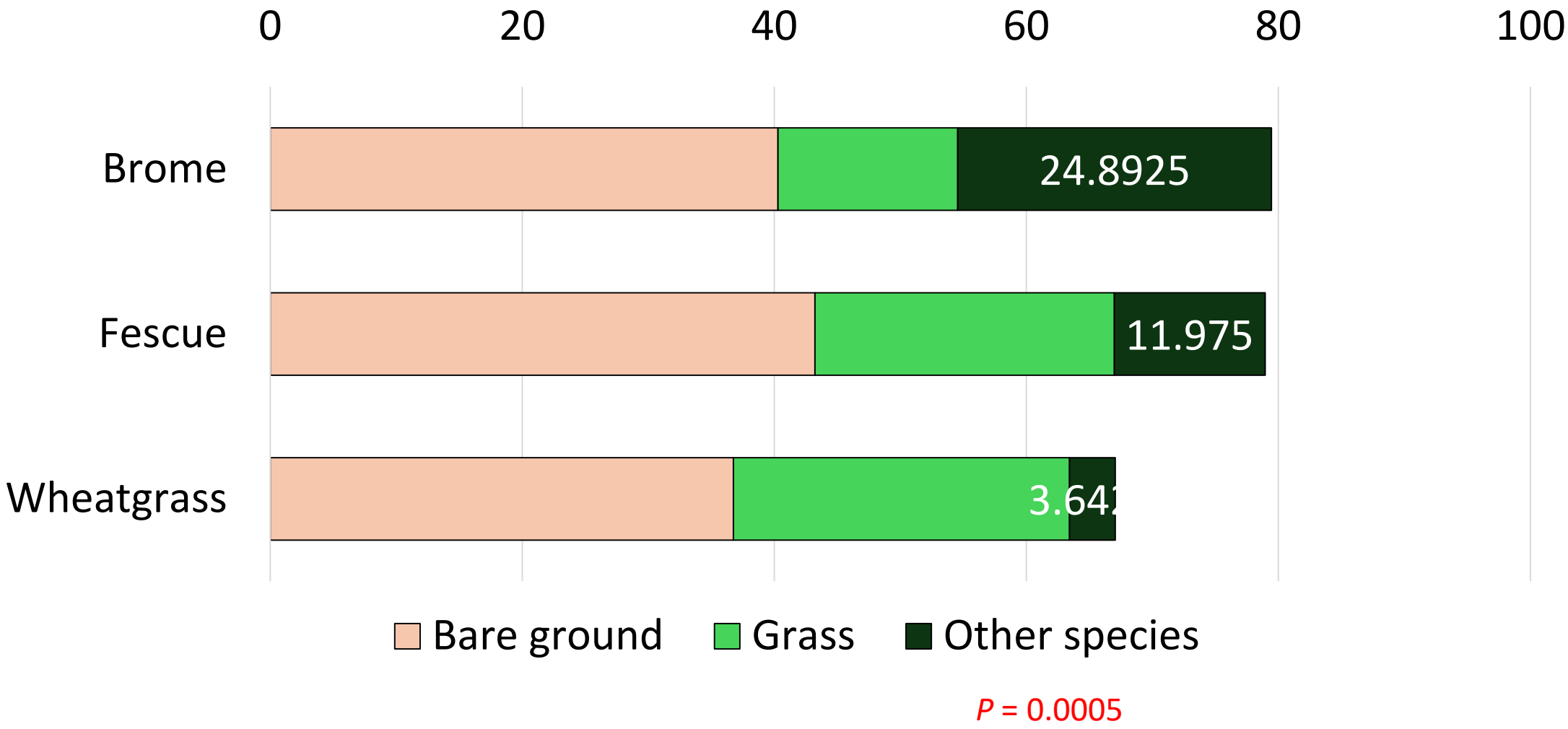
Year 2



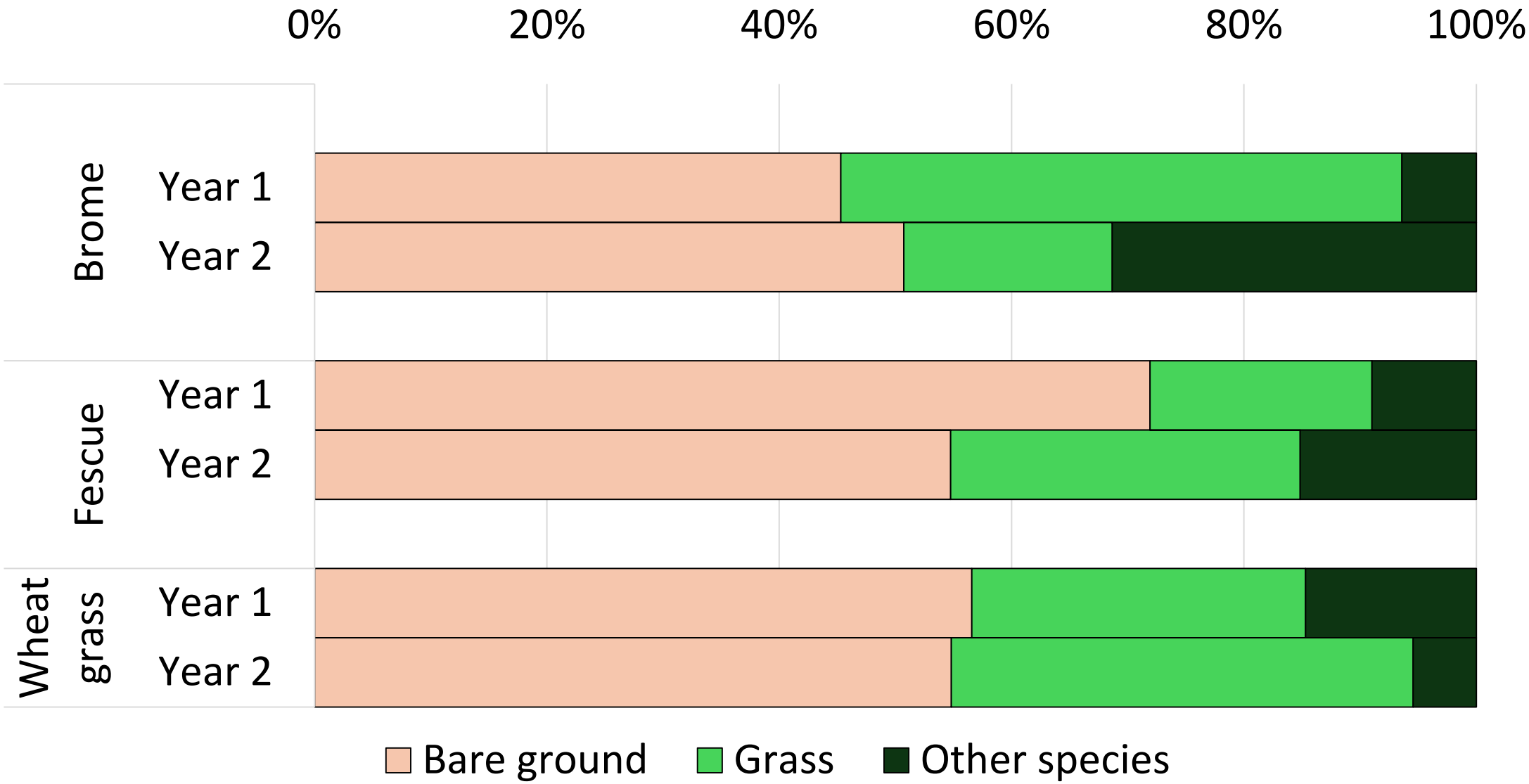
P = 0.0005

Year 2

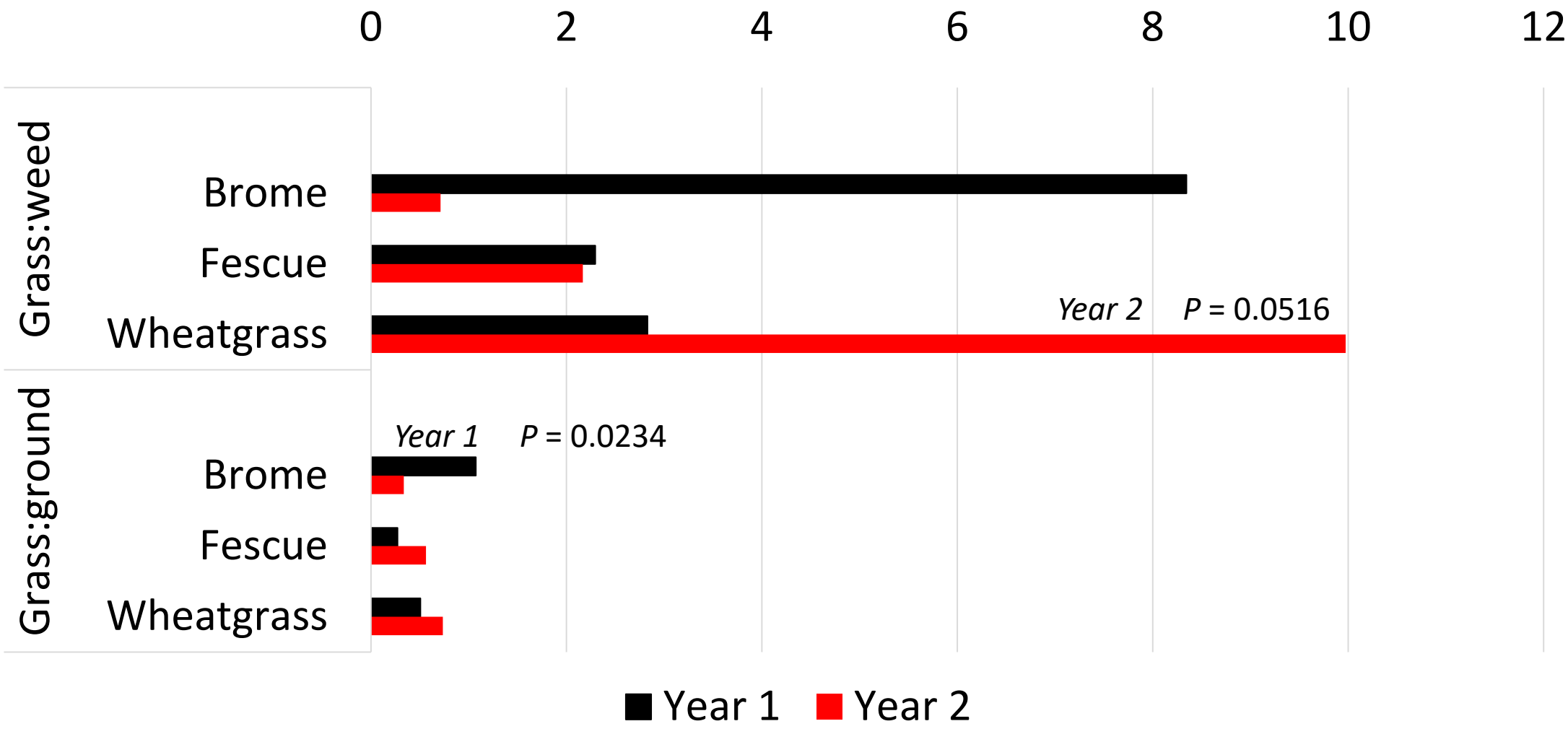


P = 0.0005

Year 1 & Year 2 Comparison



Ratios of grass to other species or bare ground




Fescue
Wheatgrass
Brome

Results of Biomass and Foraging Value

Biomass	kg/ha	Forage yield
TDN	%	Total digestible nutrients (qualitative)
TDN	kg/ha	Total digestible nutrients yield (quantitative)
CP	%	crude protein (lactating beef cows 12%, nursing calves 15%)
CP	kg/ha	Crude protein yield
ADF	%	Qualitative measure of indigestibility
NDF	%	Qualitative measure of bulk fill in the rumen
NDF48D	%	Fiber fermented over 48 h (qualitative digestibility)

Biomass and Foraging Value

	Year 1					
		Brome	Fescue	Wheatgrass	SE	P-value
Biomass	kg/ha	911	499	499	86.1	0.0668
TDN	%	60.7	65.5	64.2	0.116	0.0022
TDN	kg/ha	552	327	320	52.0	0.0818
CP	%	16.3	18.3	17.9	0.79	0.3688
CP	kg/ha	150	90	89.2	17.6	0.2171
ADF	%	31.1	26.9	28.1	0.28	0.0164
NDF	%	52.3	45.9	48.8	0.12	0.0013
NDF48D	%	66.1	71.2	73.0	0.43	0.0142

Biomass and Foraging Value

	Year 1					
		Brome	Fescue	Wheatgrass	SE	P-value
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NDF	%	52.3[a]	45.9[c]	48.8[b]	0.12	*0.0013*
NDF48D	%	66.1[b]	71.2[a]	73.0[a]	0.43	*0.0142*

Biomass and Forage Value

	Year 2					
		Brome	Fescue	Wheatgrass	SE	P
Biomass	kg/ha	201	379	335	84.1	0.3476
TDN	%		65.1	66.6	0.68	0.1575
TDN	kg/ha		160	149	53.3	0.8785
CP	%		18.8	19.5	0.598	0.4531
CP	kg/ha		70.7	66.9	11.6	0.8197
ADF	%		30.5	28.6	0.88	0.1576
NDF	%		51.5	50.0	1.66	0.5409
NDF48D	%		72.9	72.6	2.12	0.9175

Conclusion

- Fescue and wheatgrass may have better overall establishment for early spring grazing
- Reclamation of farm ground
- Ideal for grazing spring calving herds
- Establishment period ?
- Allelopathic considerations