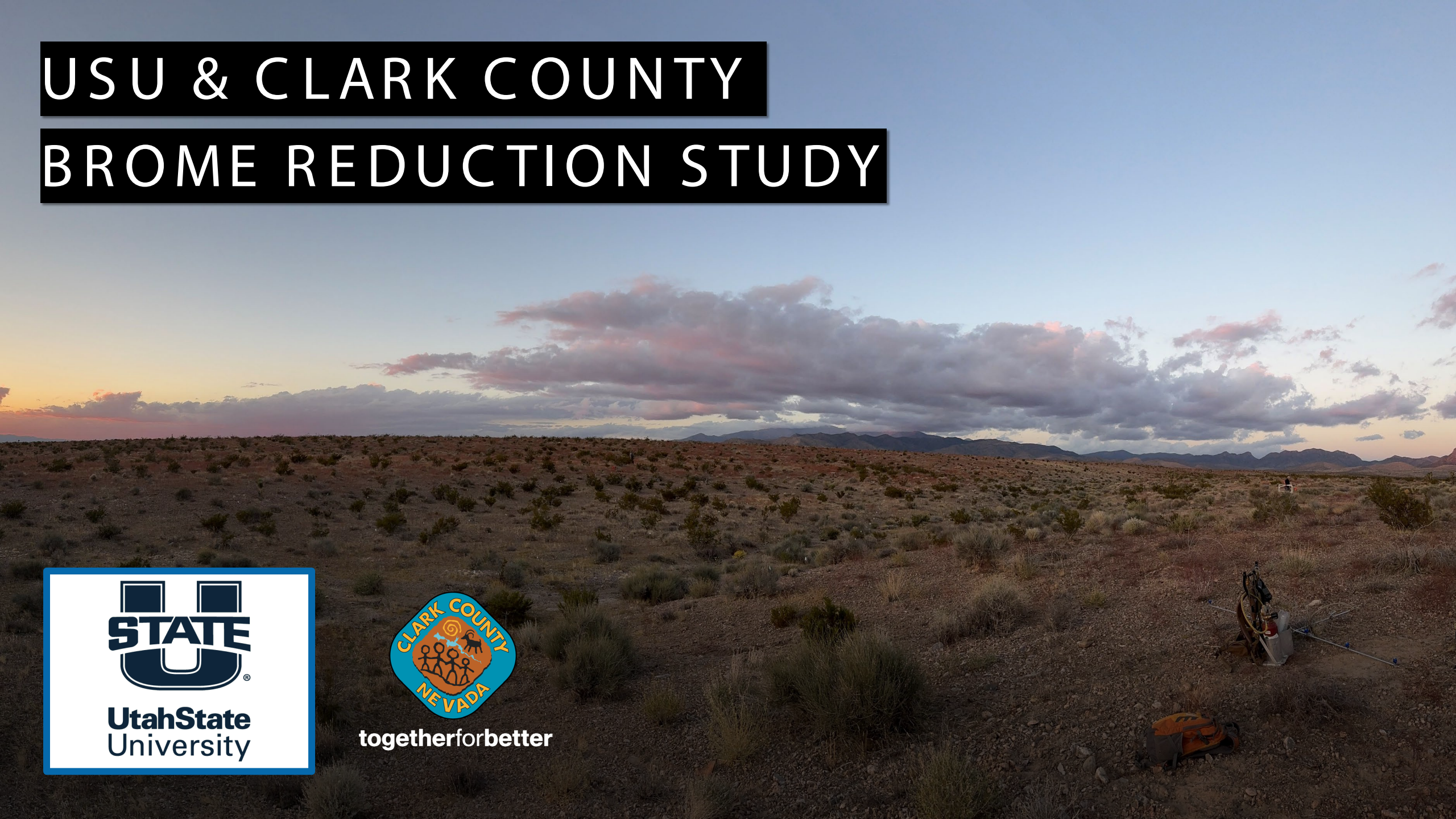
USU & CLARK COUNTY BROME REDUCTION STUDY



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USU WEED SCIENCE RESEARCH

- Invasive annual grasses (IAG) which include downy brome, medusahead, and ventenata are extremely problematic to Utah's rangeland.
- Corey Ransom has conducted trials on IAG since 1997.
- Since 2006, 60+ trials conducted on IAG's at Utah State.

CLARK COUNTY BROME REDUCTION STUDY

- Red brome (Bromus rubens), an exotic IAG occurs at Trout Canyon and increases fire susceptibility (Van Linn et al. 2015).
- Red brome has also been associated with poorer juvenile tortoise growth and survival at Trout Canyon compared to other translocation sites (Drake et al. 2018).

RESEARCH OBJECTIVES

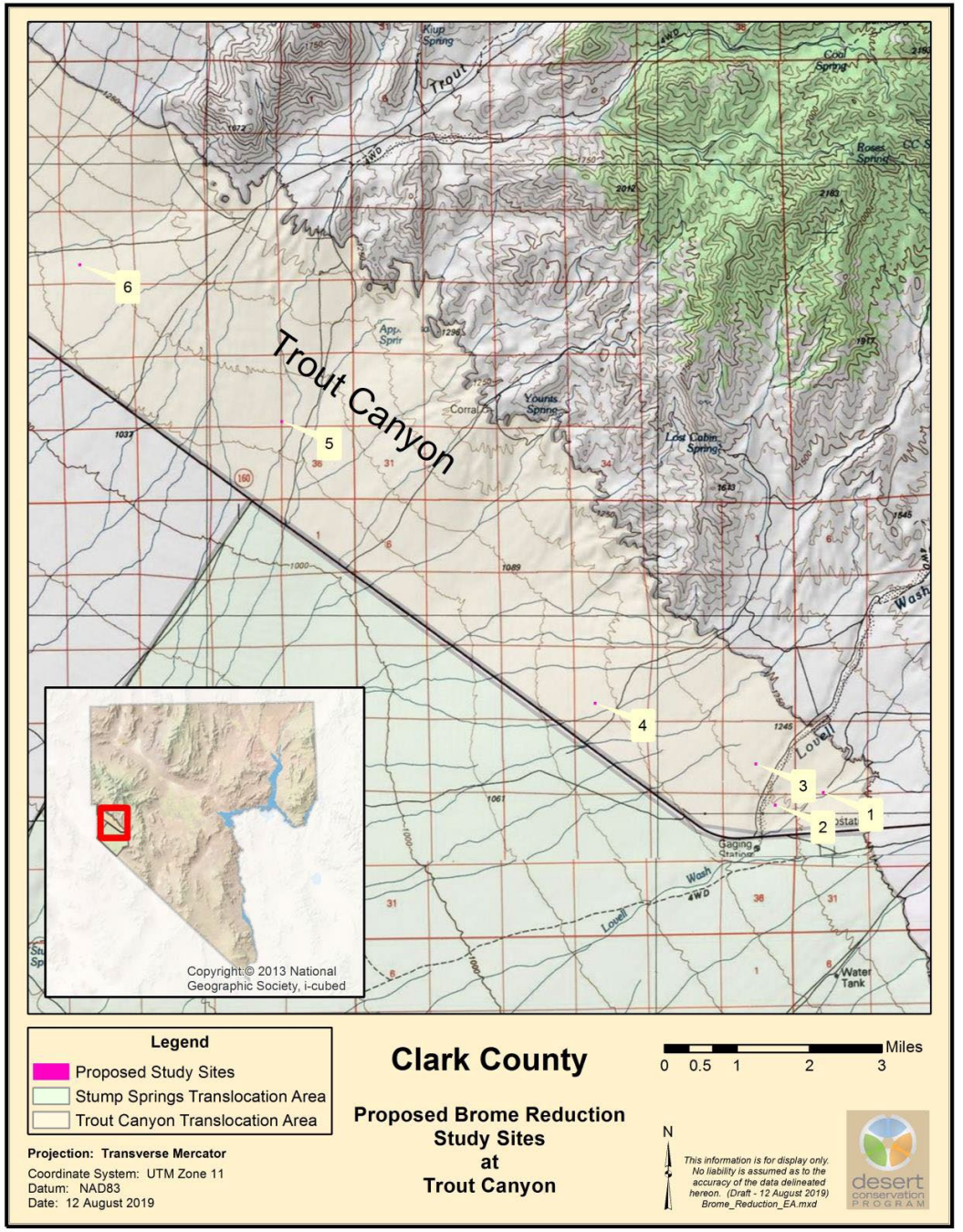
- Objective: Identify which pre-emergent herbicides and application techniques result in the greatest brome reduction.
- Objective: Compare the effects of these herbicides on native vegetation within treated areas.

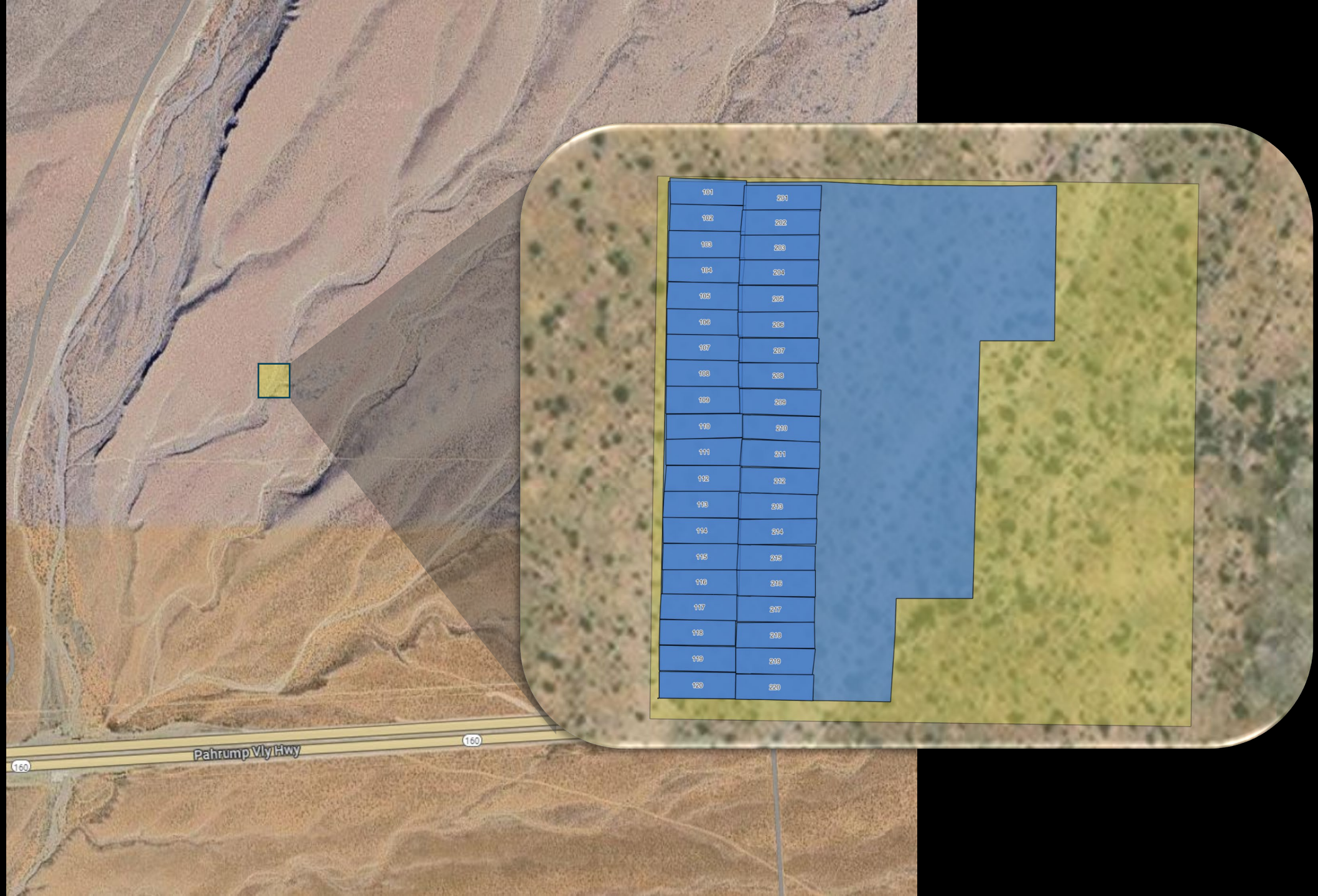
PLATEAU herbicide

REJUVRA®

LOCATION

- Trout Canyon in Clark County, NV
- Six one-acre plots were selected by Clark County as potential study plot locations.
- Study site 2 was selected by USU based on existing red brome population. (March 31, 2022)

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METHODS

TREATMENTS:

- Rejuvra, Plateau alone and in combination at various rates, PRE and POST.
- Non-ionic surfactant (NIS) and methylated seed oil (MSO) adjuvants.

TIMINGS:

- PRE – November 7, 2023
- POST – January 30, 2024

APPLICATION:

- CO_2 pressurized backpack, 20 gal/A, 40 psi.

TRIAL DESIGN:

- RCBD, 10 x 30 ft plots, 4 replications, 21 total treatments

TMT #	Timing	Treatment Name	Common Name	Rate of Application - Formulation/Acre	Rate of Application - Lbs. a.i. or a.e./Acre
1	PRE	Rejuvra	Indaziflam	1.0 fl. ounce/acre	0.013 lb. a.i./acre
2	PRE	Rejuvra	Indaziflam	3.0 fl. ounces/acre	0.039 lb. a.i./acre
3	PRE	Rejuvra	Indaziflam	5.0 fl. ounces/acre	0.065 lb. a.i./acre
4	PRE	Plateau	Imazapic	5.0 fl. ounces/acre	0.078 lb. a.e./acre
5	PRE	Rejuvra + Plateau	Indaziflam + Imazapic	1.0 fl. ounce/acre + 5.0 fl. ounces/acre	0.013 lb. a.i./acre + 0.078 lb. a.e./acre
6	PRE	Rejuvra + Plateau	Indaziflam + Imazapic	3.0 fl. ounces/acre + 5.0 fl. ounces/acre	0.039 lb. a.i./acre + 0.078 lb. a.e./acre
7	PRE	Rejuvra + Plateau	Indaziflam + Imazapic	5.0 fl. ounces/acre + 5.0 fl. ounces/acre	0.065 lb. a.i./acre + 0.078 lb. a.e./acre
8	PRE	UNTREATED	N/A	N/A	N/A
9	POST	Rejuvra + Induce	Indaziflam + Non-ionic Surfactant	1.0 fl. ounce/acre + 0.25% V/V	0.013 lb. a.i./acre + N/A
10	POST	Rejuvra + Induce	Indaziflam + Non-ionic Surfactant	3.0 fl. ounces/acre + 0.25% V/V	0.039 lb. a.i./acre + N/A
11	POST	Rejuvra + Induce	Indaziflam + Non-ionic Surfactant	5.0 fl. ounces/acre + 0.25% V/V	0.065 lb. a.i./acre + N/A
12	POST	Plateau + Induce	Imazapic + Non-ionic Surfactant	5.0 fl. ounces/acre + 0.25% V/V	0.078 lb. a.e./acre + N/A
13	POST	Rejuvra + Premium MSO	Indaziflam + Methylated Seed Oil	3.0 fl. ounces/acre + 2.0 pts/acre	0.039 lb. a.i./acre + N/A
14	POST	Rejuvra + Premium MSO	Indaziflam + Methylated Seed Oil	5.0 fl. ounces/acre + 2.0 pts./acre	0.065 lb. a.i./acre + N/A
15	POST	Plateau + Premium MSO	Imazapic + Methylated Seed Oil	5.0 fl. ounces/acre + 2.0 pts./acre	0.078 lb. a.e./acre + N/A
16	POST	Rejuvra + Plateau + Induce	Indaziflam + Imazapic + Non-ionic Surfactant	1.0 fl. ounce/acre + 5.0 fl. ounces/acre + 0.25% V/V	0.013 lb. a.i./acre + 0.078 lb. a.e./acre + N/A
17	POST	Rejuvra + Plateau + Induce	Indaziflam + Imazapic + Non-ionic Surfactant	3.0 fl. ounce/acre + 5.0 fl. ounces/acre + 0.25% V/V	0.039 lb. a.i./acre + 0.078 lb. a.e./acre + N/A
18	POST	Rejuvra + Plateau + Induce	Indaziflam + Imazapic + Non-ionic Surfactant	5.0 fl. ounce/acre + 5.0 fl. ounces/acre + 0.25% V/V	0.065 lb. a.i./acre + 0.078 lb. a.e./acre + N/A
19	POST	Rejuvra + Plateau + Premium MSO	Indaziflam + Imazapic + Methylated Seed Oil	3.0 fl. ounce/acre + 5.0 fl. ounces/acre + 2.0 pts./acre	0.039 lb. a.i./acre + 0.078 lb. a.e./acre + N/A
20	POST	Rejuvra + Plateau + Premium MSO	Indaziflam + Imazapic + Methylated Seed Oil	5.0 fl. ounce/acre + 5.0 fl. ounces/acre + 2.0 pts./acre	0.065 lb. a.i./acre + 0.078 lb. a.e./acre + N/A
21	POST	UNTREATED	N/A	N/A	N/A

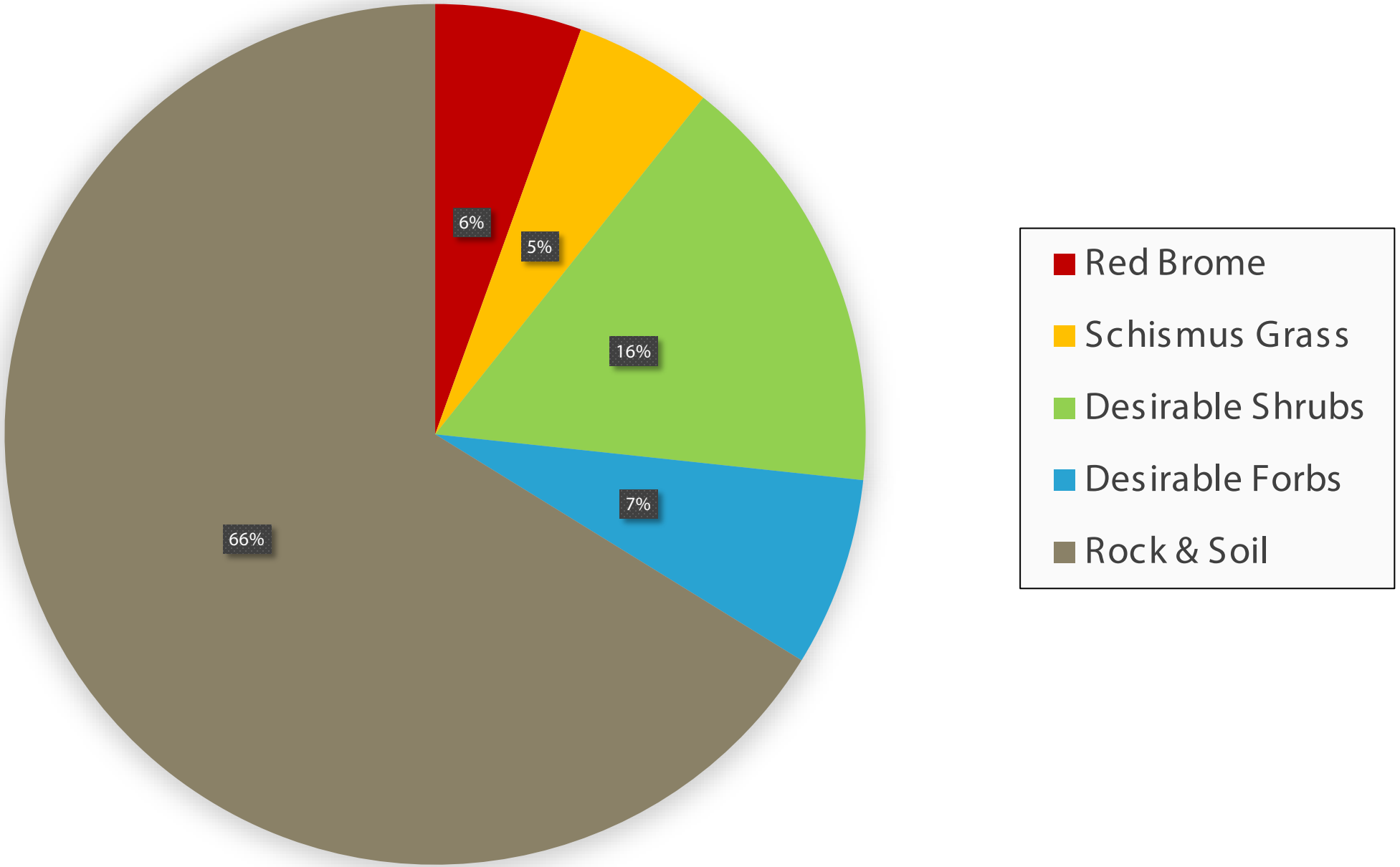
DATA COLLECTION

- November 6, 2023:
  - Visual estimate of cover.
  - Whole plot counts.
- January 29, 2024:
  - Frame counts in untreated control plots.
- Mar 27, 2024:
  - Visual estimate of cover.
  - Whole plot counts.
  - Frame counts.

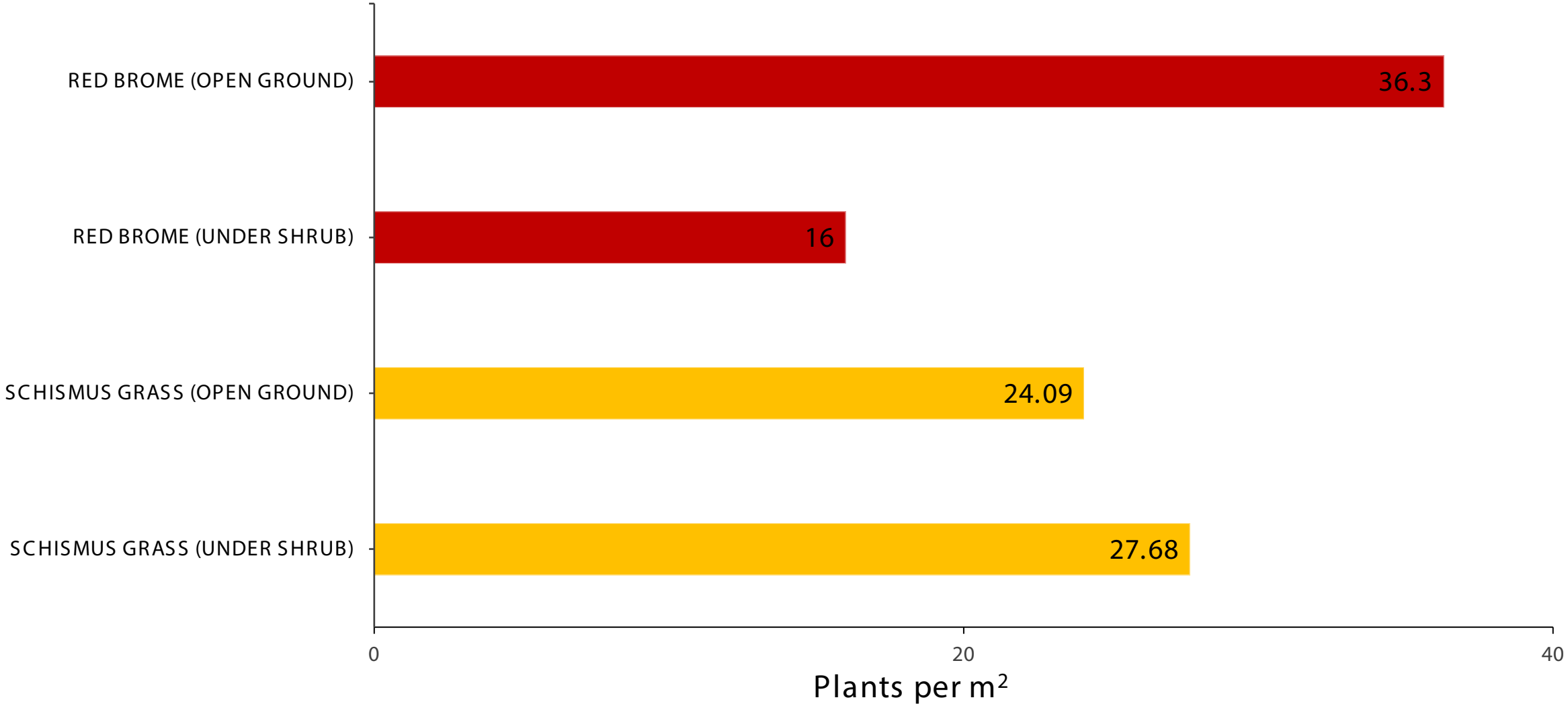
SOME SPECIES ON SITE

- Red Brome (Bromus rubens L.)
- Schismus grass (Schismus barbatus)
- Creosote bush (Larrea tridentata)
- Desert trumpet (Eriogonum inflatum)
- Ephedra (Ephedra californica)
- Littleleaf ratany (Krameria erecta)
- Desert marigold (Baileya multiradiata)
- Greasewood (Sarcobatus baileyi)
- Desert gold poppy (Eschscholzia glyptosperma)
- Fluff grass (Dasyochloa pulchella)
- Mexican bladder sage (Scutellaria mexicana)
- Blue sage (Salvia dorrii)
- Whitestem paper flower (Psilostrophe cooperi)
- Anderson's desert thorn (Lycium andersonii)
- Wooly bursage (Ambrosia eriocentra)
- Filaree (Erodium cicutarium)

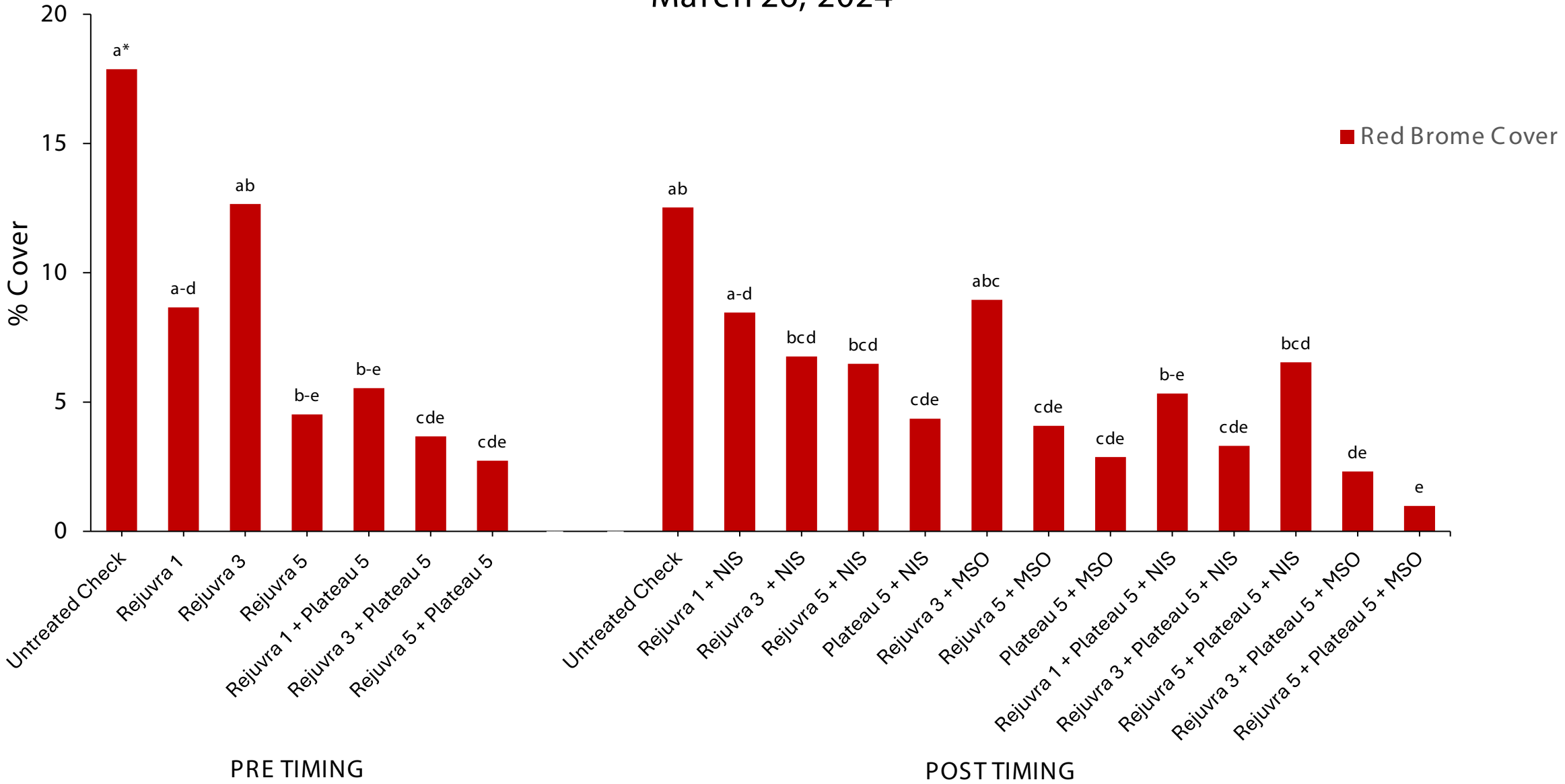
Average Community Composition for Entire Trial Area - Pretreatment
November 6, 2023



Untreated Control Plot Densities
January 29, 2024

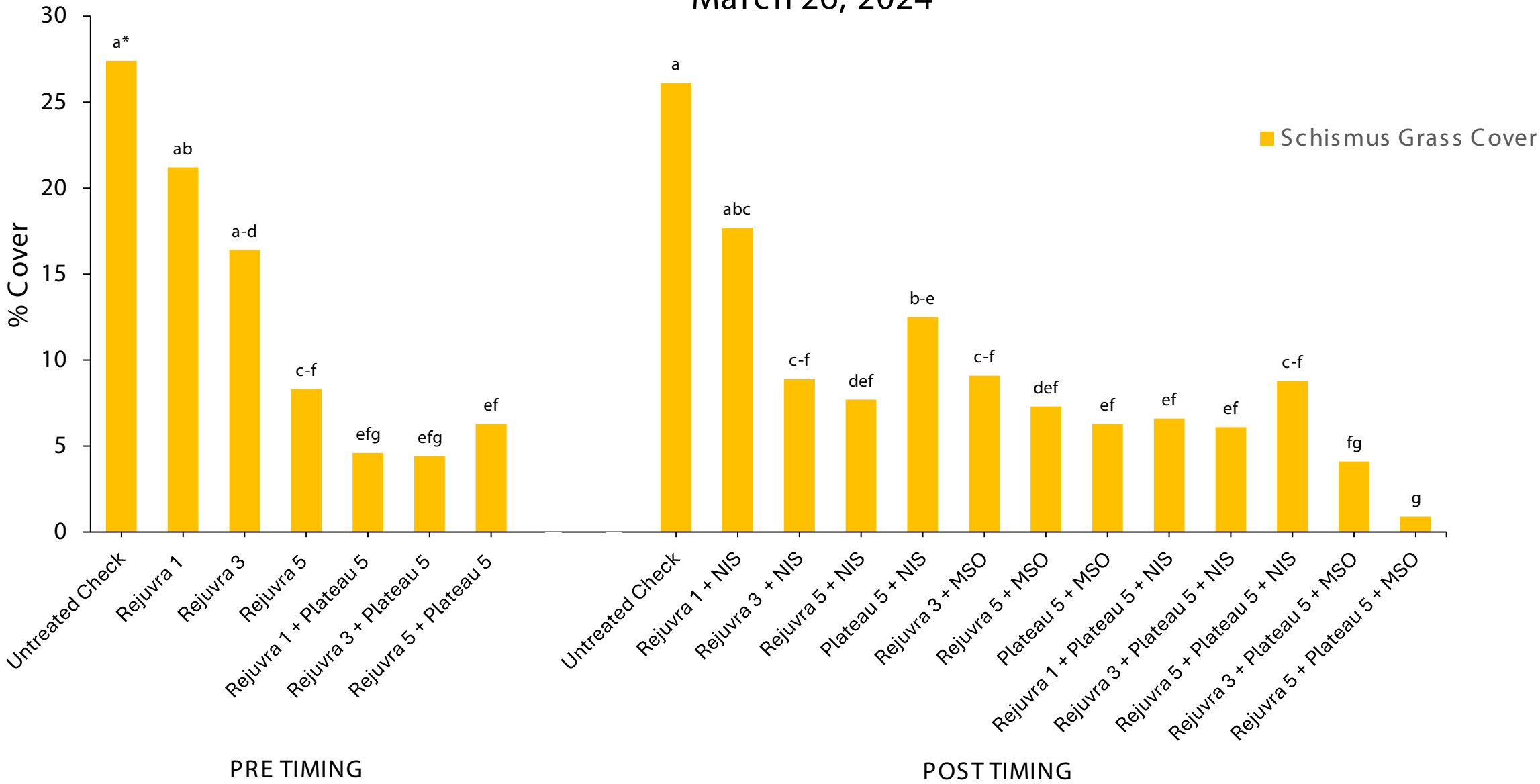


Red Brome Visual Cover Estimate
March 26, 2024



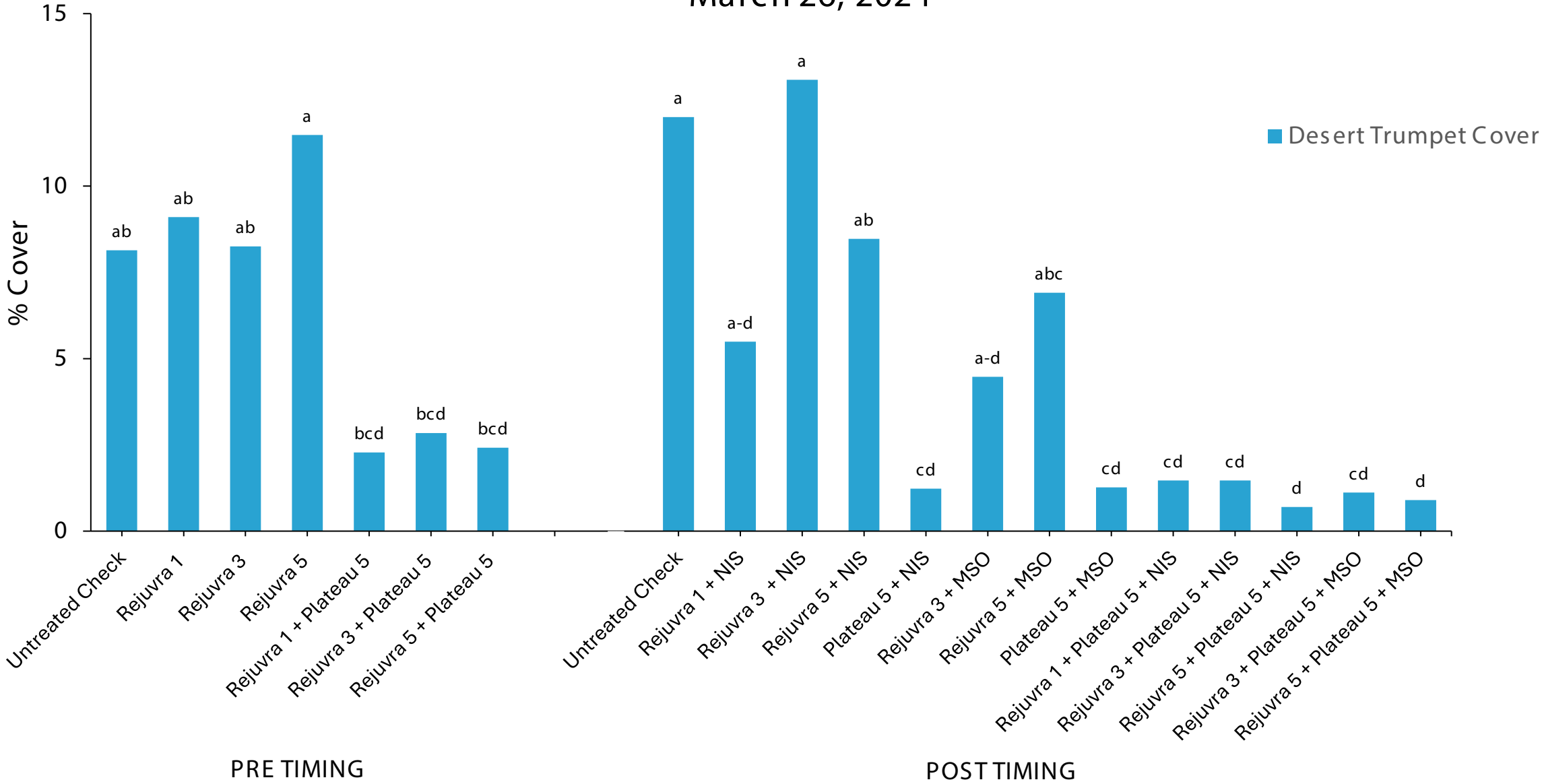
* Significant at p=0.10 Treatments sharing letters are not significantly different from one another

Schismus Grass Visual Cover Estimate
March 26, 2024



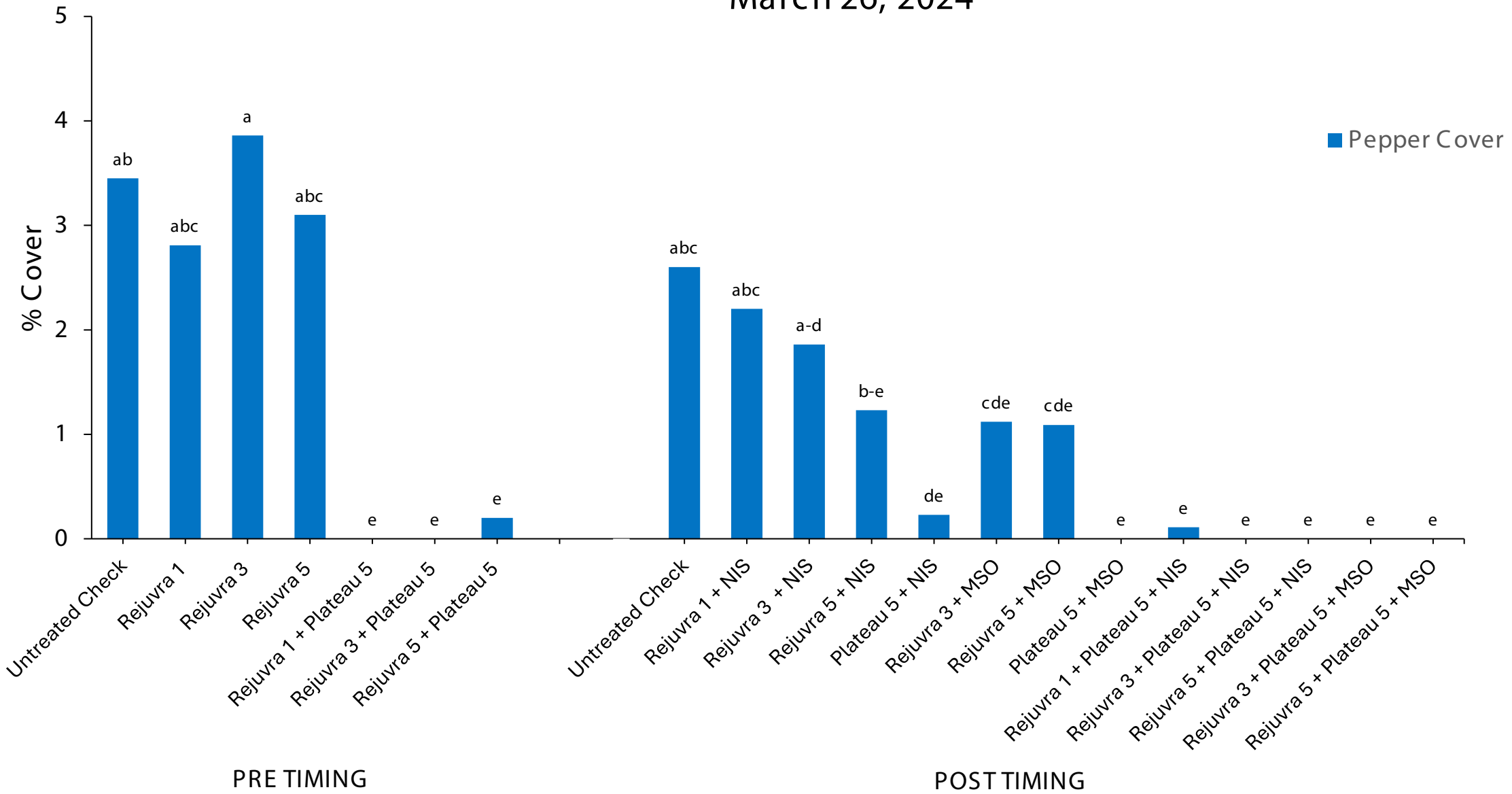
* Significant at p=0.05 Treatments sharing letters are not significantly different from one another

Desert Trumpet Visual Cover Estimate
March 26, 2024



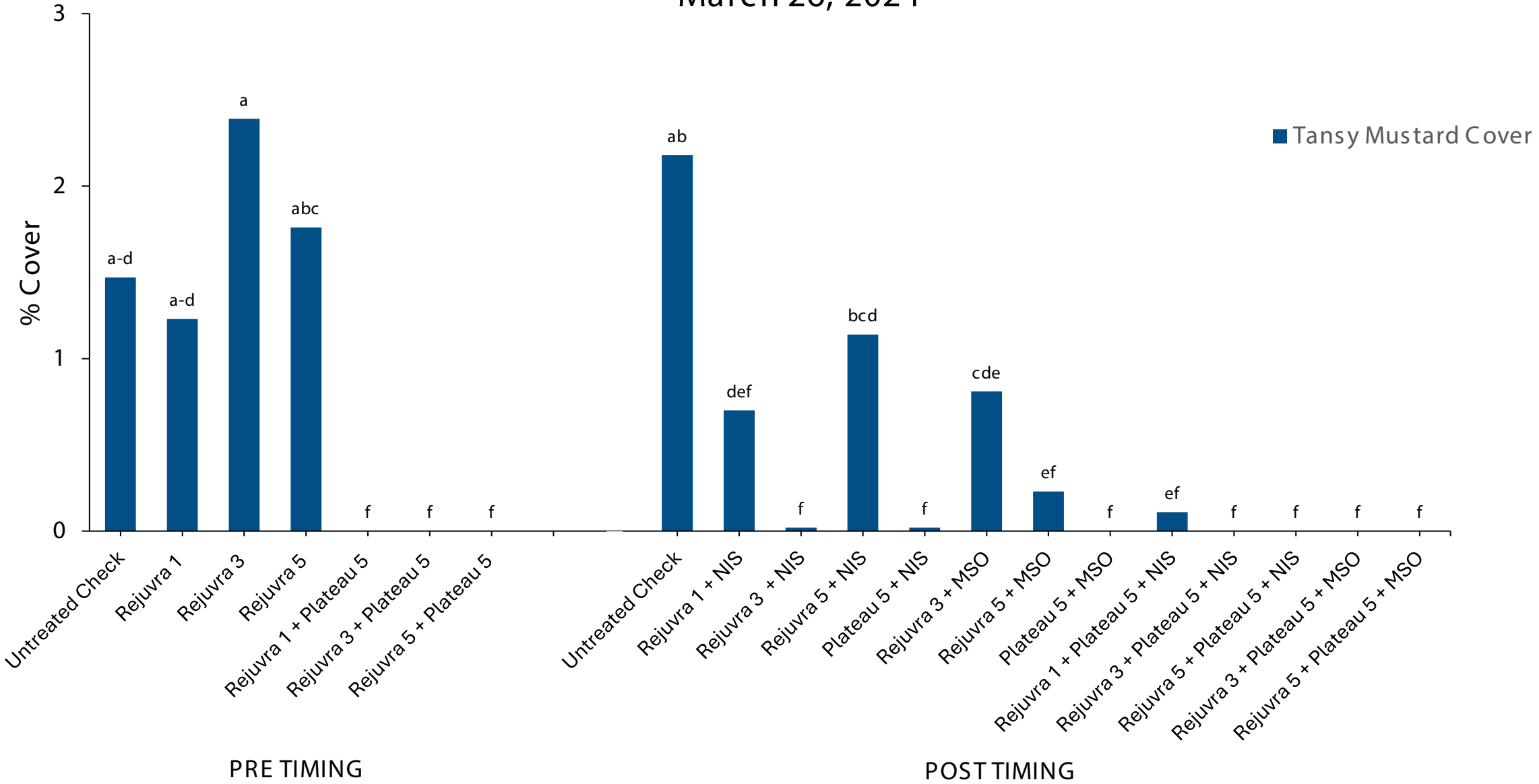
* Significant at p=0.05 Treatments sharing letters are not significantly different from one another

Desert Pepperweed Visual Cover Estimate
March 26, 2024



* Significant at p=0.05 Treatments sharing letters are not significantly different from one another

Tansy Mustard Visual Cover Estimate
March 26, 2024



* Significant at p=0.05 Treatments sharing letters are not significantly different from one another

OBSERVATIONS

- Annual grass cover across all the sites was limited and highly variable.
- Germination patterns also appeared variable, with micro scale differences resulting in differential germination and final maturity differences.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OBSERVATIONS

- Annual grass cover across all the sites was limited and highly variable.
- Germination patterns also appeared variable, with micro scale differences resulting in differential germination and final maturity differences.
- Perennial plant growth and flowering was impressive on November 6, 2023.
- Follow-up observations in fall of 2024 will be best correlated with 2023 pretreatment evaluations.

SUMMARY

- Annual grass control was less than expected, likely related to discontinuous germination/erratic moisture*.
- Injury to non-target species was most related to Plateau.
- Major impact to perennial/woody species were not observed.
- It is expected that invasive annual grass control with Rejuvra will improve this next cycle as it should be in place to impact germination

- Acknowledgements

- Special thanks to:

  Stef Ferrazzano, DCP

  Tarl Norman, BLM

- Contact Information
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