Herbicide Options for Weed Control in DT Soybean in Western North Dakota

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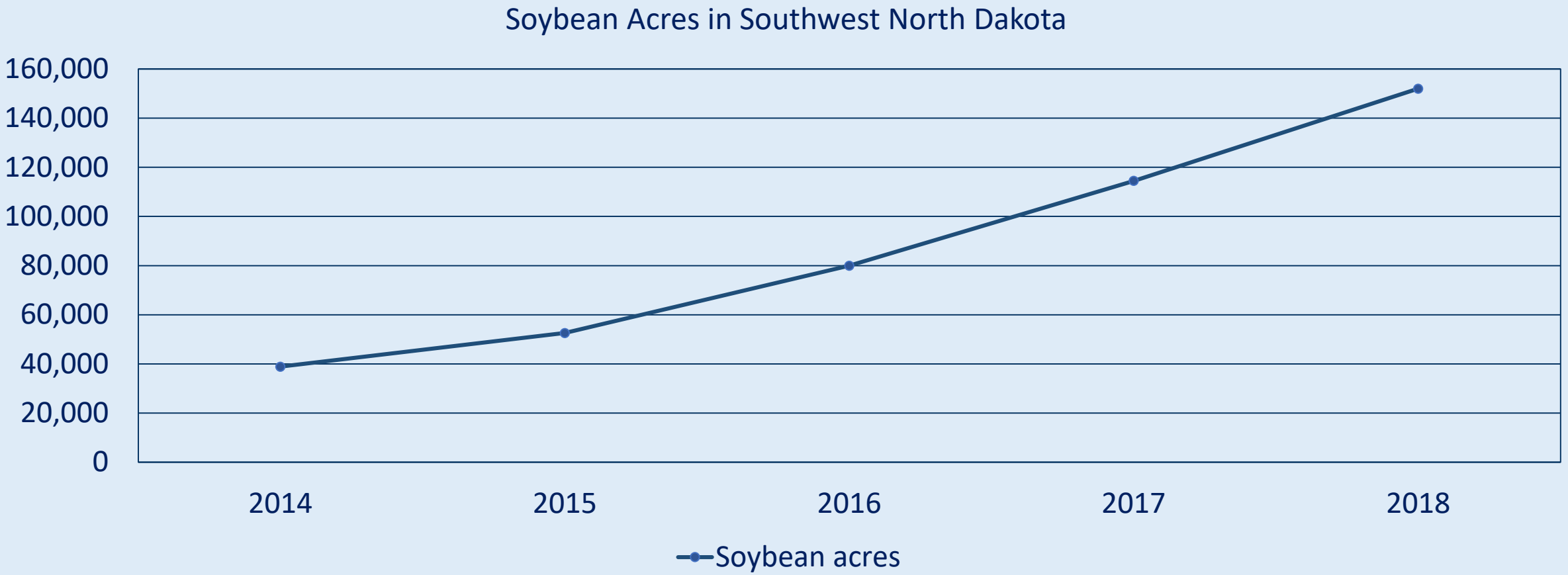
Background

- Number of acres of soybean are increasing in Southwest North Dakota
  - Increased from less than 40,000 acres in 2014 to nearly 160,000 acres in 2018



Counties include: Adams, Billings, Bowman, Dunn, Golden Valley, Grant, Mercer, Morton, Oliver, Sioux, Slope, and Stark

Background

- Number of acres of soybean are increasing in Southwest North Dakota
  - Increased from less than 40,000 acres in 2014 to nearly 160,000 acres in 2018
  - It is still a challenge to get crop insurance in many southwest counties
  - It is becoming an important rotational crop for many growers
- Challenges of growing soybean in southwest North Dakota differ from eastern North Dakota
  - No-till production – preplant burndown
  - Different weed problems – kochia, winter annuals, wild buckwheat, etc.
  - Less rainfall – preemergence herbicide activity, slower growth, lower yield
  - Lower soybean population – slower canopy cover
  - Fewer herbicide options – Flexstar restrictions, concern with carryover to rotational crops (canola, lentil, field pea, sunflower, etc.)

PREPLANT Treatments

No.	Treatment	Rate
1	Roundup PowerMax	28 oz/A
2	Roundup PowerMax	43 oz/A
3	RU + Valor	28 + 3 oz/A
4	RU + Fierce	28 + 3 oz/A
5	RU + Fierce + Metribuzin	28 + 3 + 5.3 oz/A
6	RU + Fierce + Metribuzin + Prowl H2O	28 + 3 + 5.3 + 34 oz/A
7	RU + Broadaxe	28 + 32 oz/A
8	RU + Authority Supreme	28 + 11.5 oz/A
9	RU + Authority Elite	28 + 38.7 oz/A
10	RU + Spartan + Metribuzin	28 + 4.3 + 4.3
11	RU + Sharpen + Prowl	28 + 1 + 34 oz/A
12	RU + Sharpen + Warrant	28 + 1 +48 oz/A
13	Untreated	

AMS included at 17 lbs/100 gallons in all treatments
MSO (1% v/v) included in treatments 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12

Methods

- All treatments applied using tractor-mounted research sprayer
  - 10 gallons per acre
  - Flat fan nozzles (11002 XR)
  - 38 PSI
- Environmental conditions at time of application
  - Time/Date of application: 9:20-10:05 AM on 6/6/19
  - Temperature: 75 F (Maximum temp of 84 F on day of application)
  - Wind speed: 6 MPH (Maximum gust of 9 MPH)
  - Soil Temperature: 62 F
  - Relative Humidity: 37%
  - Cloud cover: 0%
- Time to next rainfall: 34 Hours (0.45 inches); 0.63 inches in week after treatment
- Soybean “AsGrow 03X7” planted on June 8 at 180,000 sd/A in 30-inch rows
- Roundup + Engenia applied on July 8 over all treatments to control escaped weeds

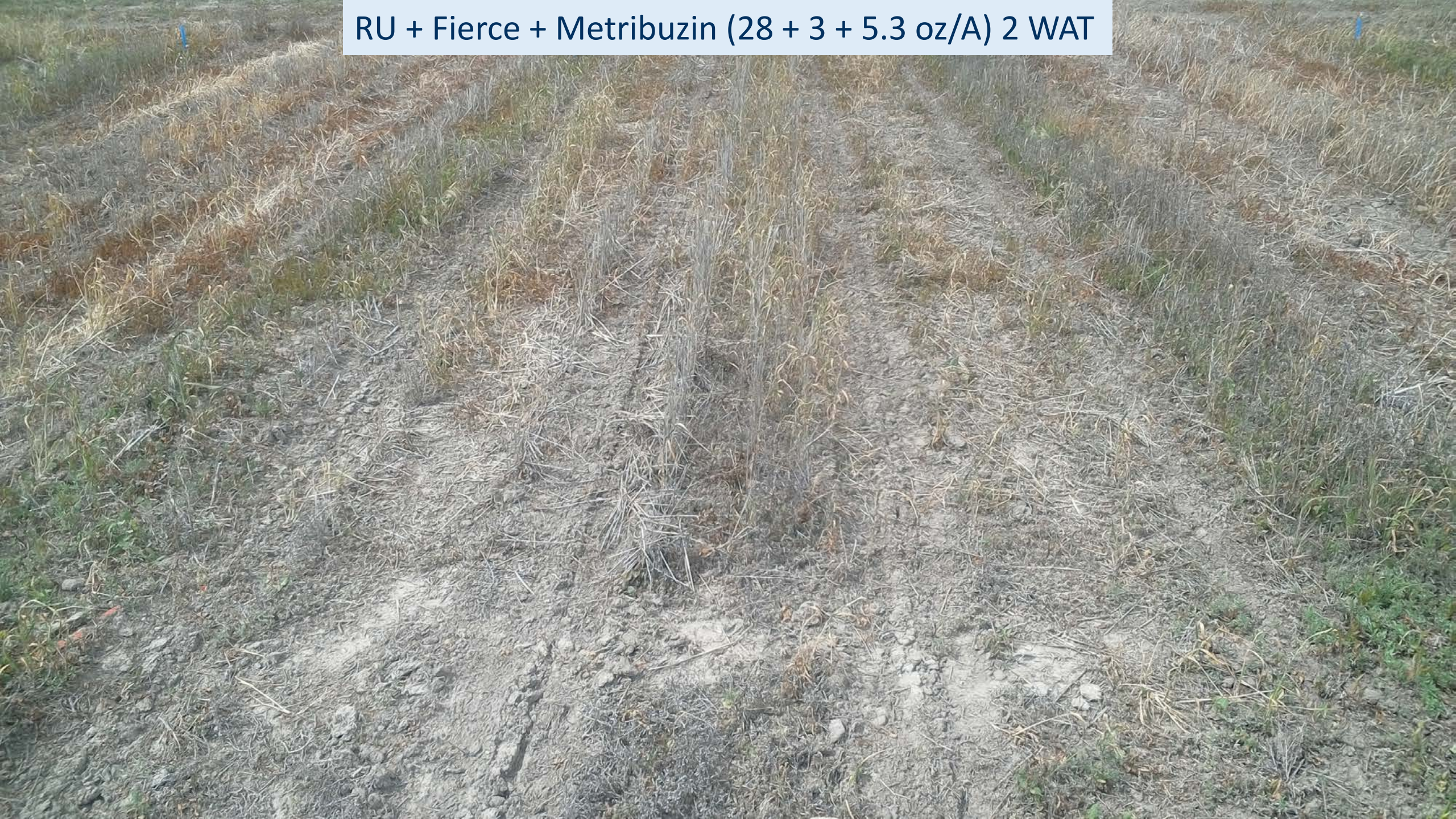

Untreated Control 2 WAT


Roundup PowerMAX (28 oz/A) 2 WAT


Roundup PowerMAX (43 oz/A) 2 WAT


RU + Valor (28 + 3 oz/A) 2 WAT


RU + Fierce (28 + 3 oz/A) 2 WAT


RU + Fierce + Metribuzin (28 + 3 + 5.3 oz/A) 2 WAT


RU + Fierce + Metribuzin + Prowl H2O (28 + 3 + 5.3 + 34 oz/A) 2 WAT


RU + BroadAxe (28 + 32 oz/A) 2 WAT


RU + Authority Supreme (28 + 11.5 oz/A) 2 WAT

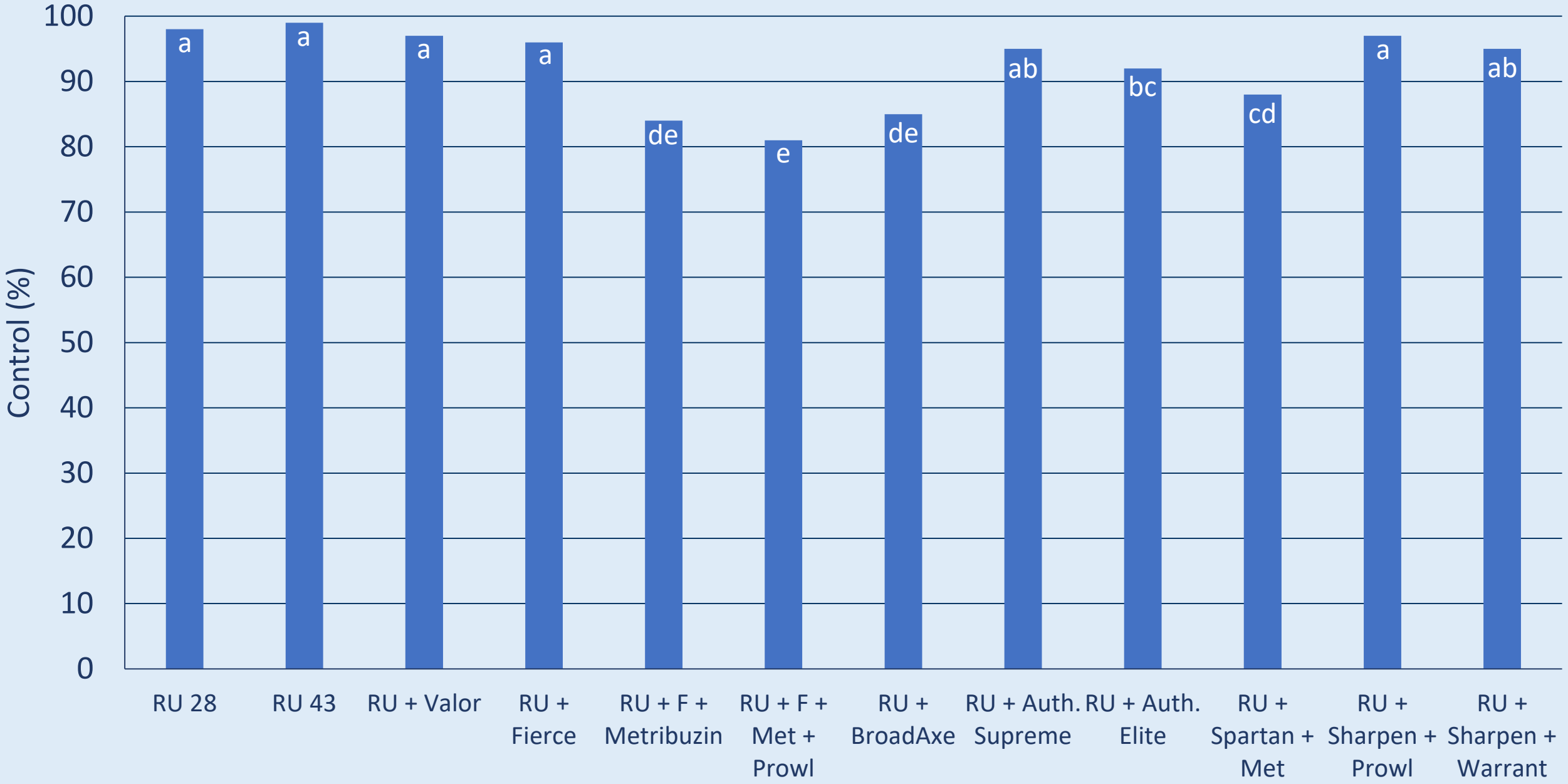

RU + Authority Elite (28 + 38.7 oz/A) 2 WAT


RU + Spartan + Metribuzin (28 + 4.3 + 4.3 oz/A) 2 WAT

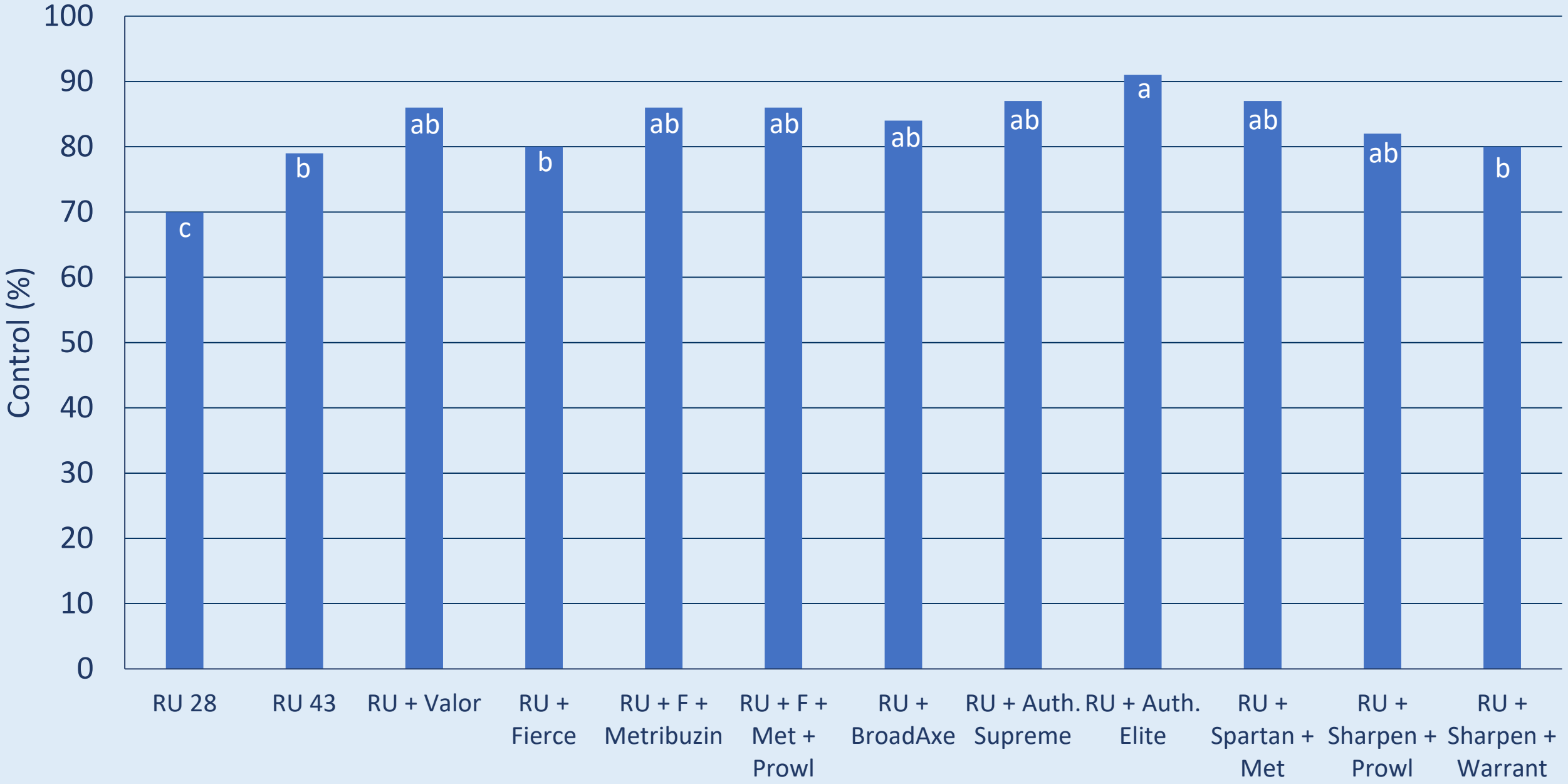

RU + Sharpen + Prowl H2O (28 + 1 + 34 oz/A) 2 WAT


RU + Sharpen + Warrant (28 + 1 + 64 oz/A) 2 WAT

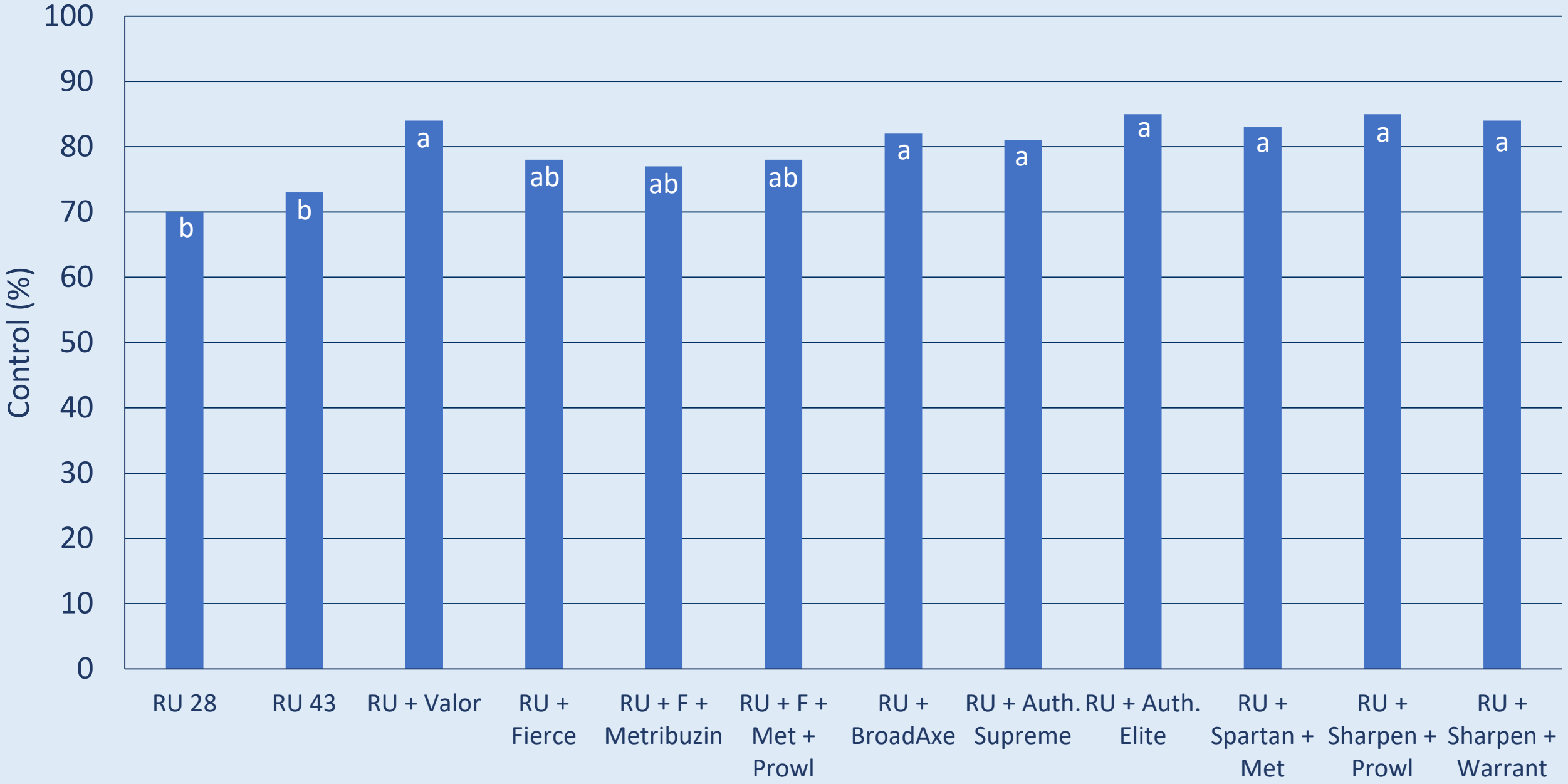
Annual Grass Control (2 WAT)



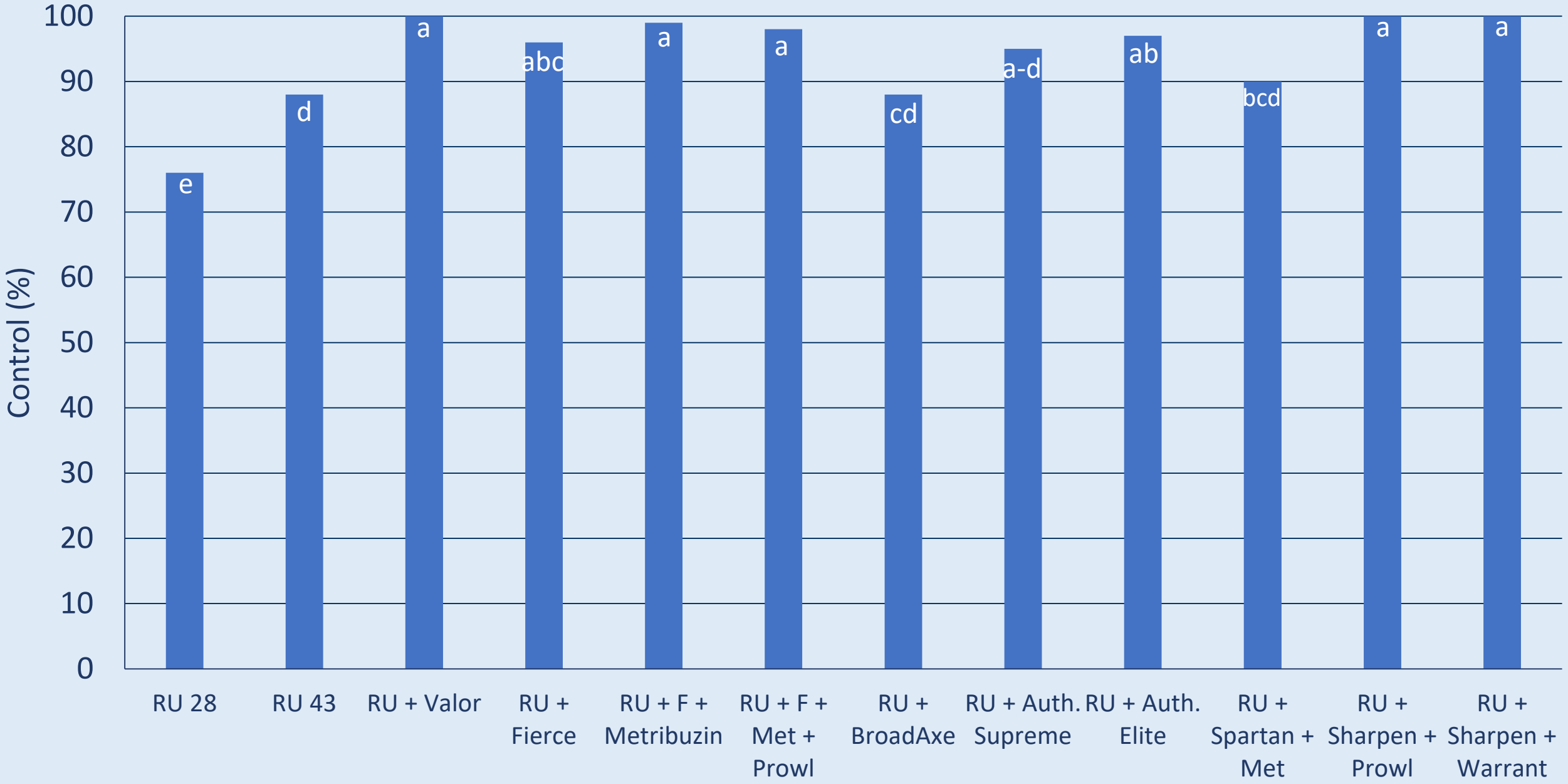
Kochia Control (2 WAT)



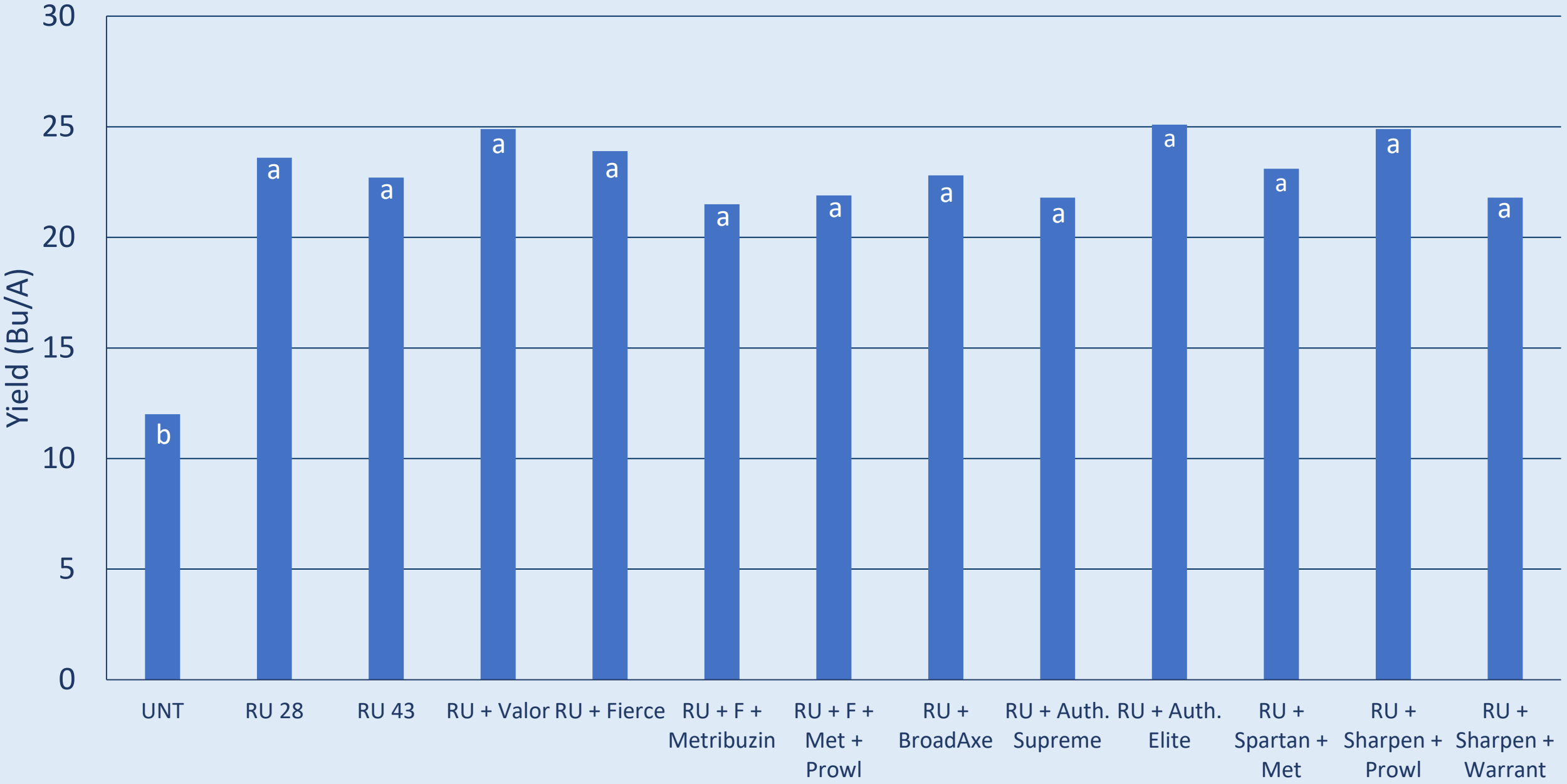
Wild Buckwheat Control (2 WAT)



Prickly Lettuce Control (2 WAT)



Soybean Yield



POST Treatments

No.	Treatment	Rate
1	Roundup PowerMax	28 oz/A
2	Roundup PowerMax	43 oz/A
3	Engenia (dicamba)	12.8 oz/A
4	Roundup PowerMax + Engenia	28 + 12.8 oz/A
5	Roundup PowerMax + Anthem	28 + 10 oz/A
6	Roundup PowerMax + Engenia + Anthem	28 + 12.8 + 10 oz/A
7	Pursuit	3 oz/A
8	Roundup PowerMax + Pursuit	28 + 3 oz/A
9	Engenia + Pursuit	12.8 + 3 oz/A
10	Untreated	

AMS included at 8.5 lbs/100 gallons in treatments 1, 2, 5, and 8
NIS included (0.25% v/v) in treatments 1, 2, 3, 4, 5, and 6
MSO (1.5 pt/A) included in treatments 7, 8, and 9

Methods

- Soybean “AsGrow 03X7” planted on June 8 at 180,000 sd/A in 30-inch rows
  - pre-plant burndown of glyphosate to control existing weeds applied on June 6
- Environmental conditions at time of application of POST treatments
  - Time/Date of application: 11:18-11:45 AM on 7/8/19
  - Temperature: 76 F (Maximum temp of 83 F on day of application)
  - Wind speed: 4 MPH (Maximum gust of 8 MPH)
  - Soil Temperature: 59 F
  - Relative Humidity: 77%
  - Cloud cover: 100%
  - Time to next rainfall: 12 Hours (0.41 inches within 24 hours)
- All treatments applied using tractor-mounted research sprayer
  - 15 gallons per acre
  - Air induction Tee-Jet nozzles (11002 TTI)
  - 38 PSI


Untreated Control 2 WAT

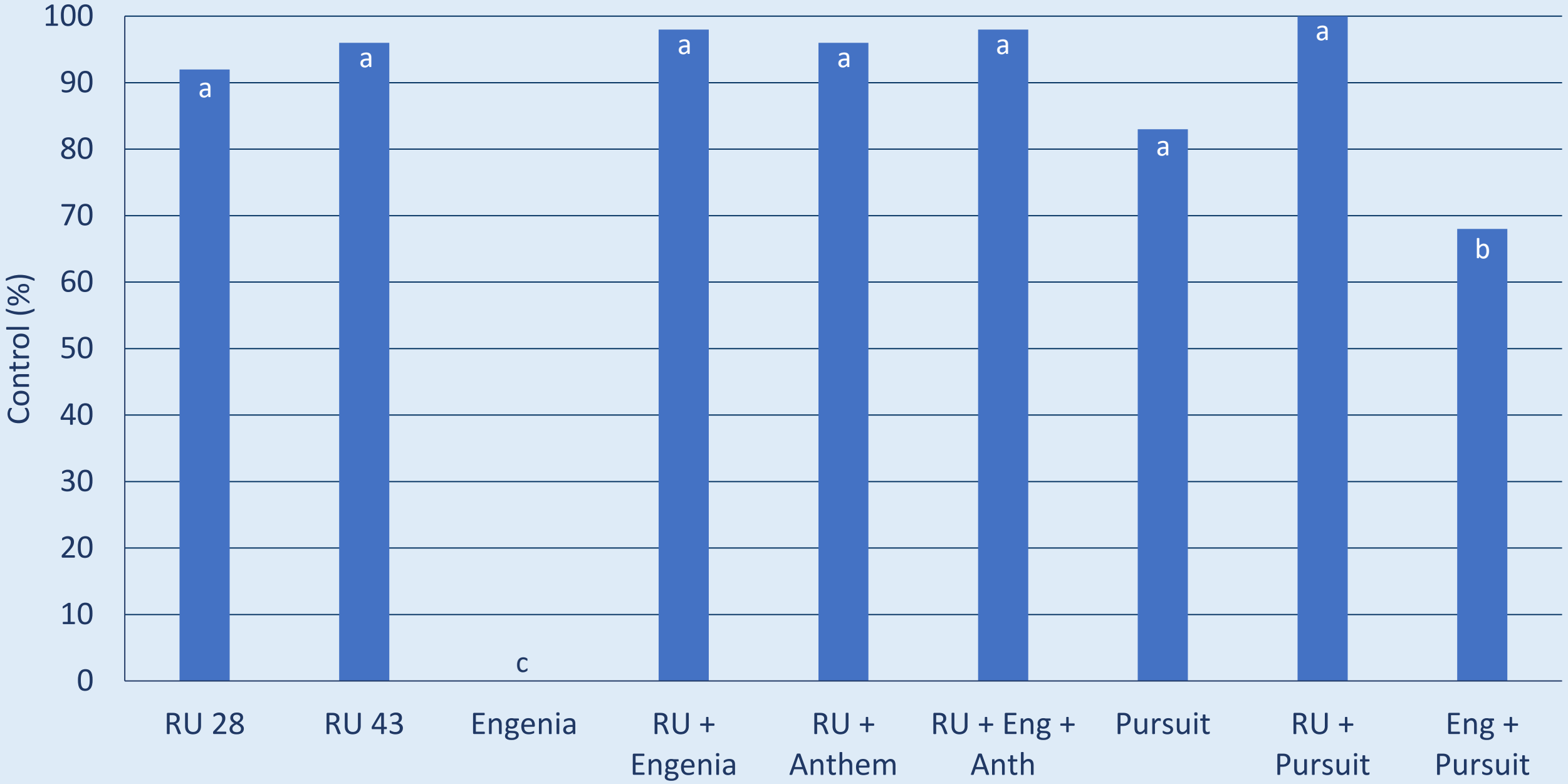

Roundup PowerMAX (28 oz/A) 2 WAT


Roundup PowerMAX (43 oz/A) 2 WAT

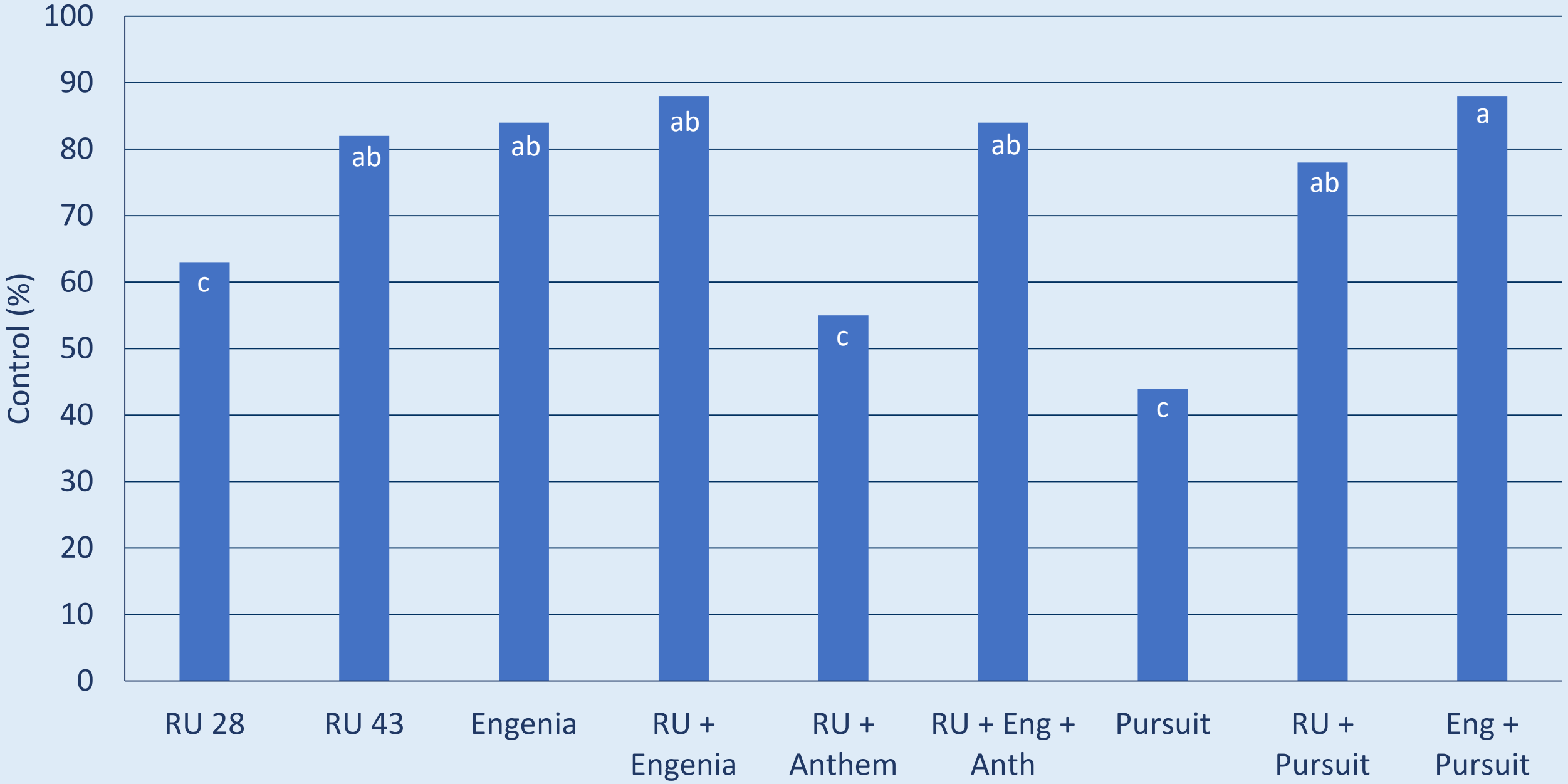

Engenia (12.8 oz/A) 2 WAT


Engenia + Roundup PowerMAX (12.8 + 28 oz/A) 2 WAT

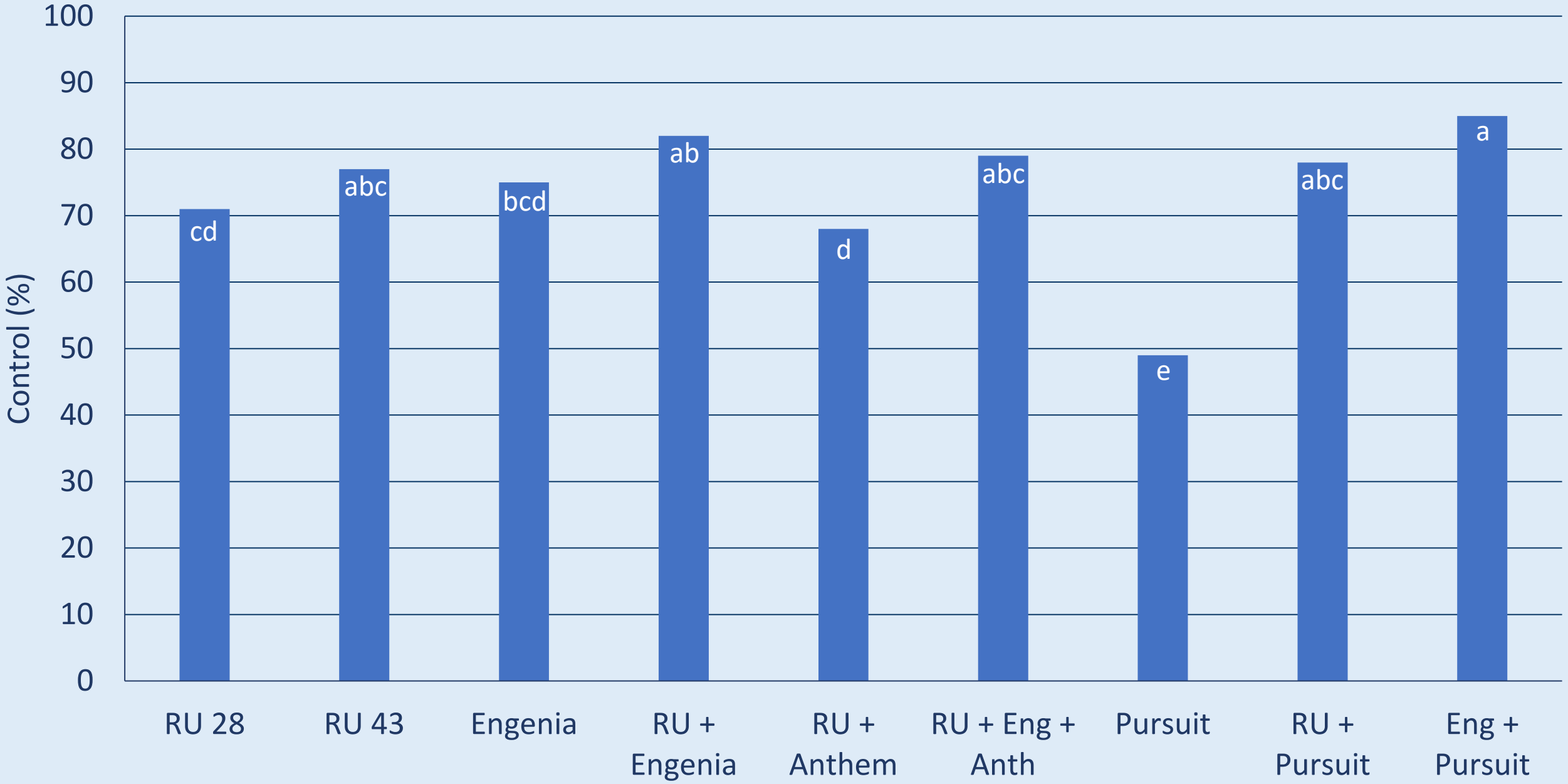
Green Foxtail Control (5 WAT)



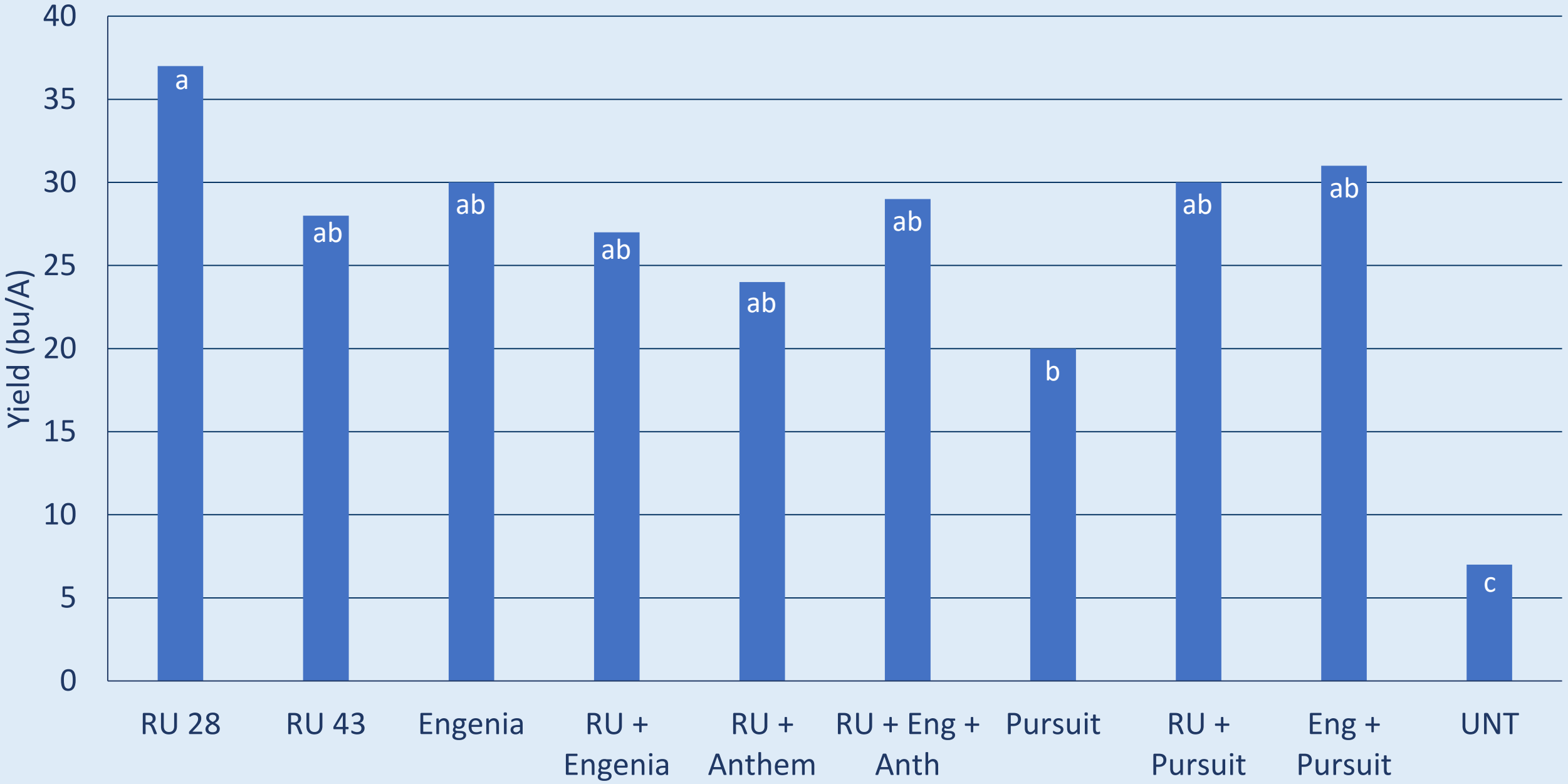
Kochia Control (5 WAT)



Wild Buckwheat Control (5 WAT)



Soybean Yield



Summary

- Controlling weeds in western North Dakota will require
  - A good Pre-plant burndown
    - Should include herbicides providing residual control
    - Avoid antagonism
  - A good POST treatment
    - Roundup + dicamba helped to control tougher weeds like kochia and wild buckwheat
    - Soybeans are very competitive if you give them an advantage

Thanks!