

INTRODUCTION

- Penoxsulam is a sulfonamide Triazolopyrimidine sulfonamide herbicide developed by Dow AgroSciences for use in drill- and water-seeded rice.
- Penoxsulam, reportedly, provides postemergence and soil activity on several important broadleaf weeds in rice, demonstrates excellent selectivity in rice, and has few tank mix issues.
- Penoxsulam is absorbed by plants through the leaves, shoots and roots and translocated via the phloem and xylem.
- As with many ALS inhibiting herbicide symptoms, chlorosis of the growing point and reddening of leaf veins, begin appearing in 3 to 7 days. Complete plant death usually occurs 14 to 21 days.

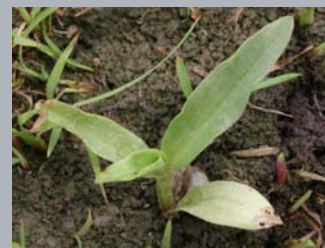
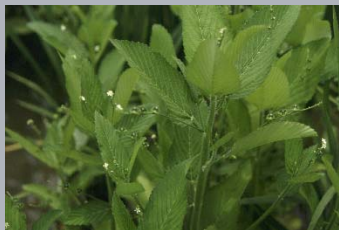
OBJECTIVES

- Evaluate penoxsulam in drill seeded rice (including Clearfield rice) for broadleaf weed control.
- Evaluate penoxsulam for broadleaf weed control in water-seeded rice.

MATERIALS and METHODS

- Field experiments were conducted in 2004 and 2005 at the Northeast Research Station near St. Joseph, La.
- Randomized complete block designs were used, and trials were replicated three times.

- Rice was drill-seeded at 101 kg/ha on a 19 cm spacing in dry-seeded rice and broadcast at 170 kg/ha in water-seeded rice.
- Water management:
 - Water-seeded, after draining the seeding flood, plots were flushed weekly and flooded 4 WAP.
 - Dry-seeded, plots were flushed as needed and flooded 5 WAP.
- Herbicide treatments were applied, using CO₂ pressurized backpack sprayer calibrated to deliver 140 L/ha, to plots measuring 2 by 4.5 meters.
- All penoxsulam treatments were applied with 2.3 L/ha crop oil concentrate.



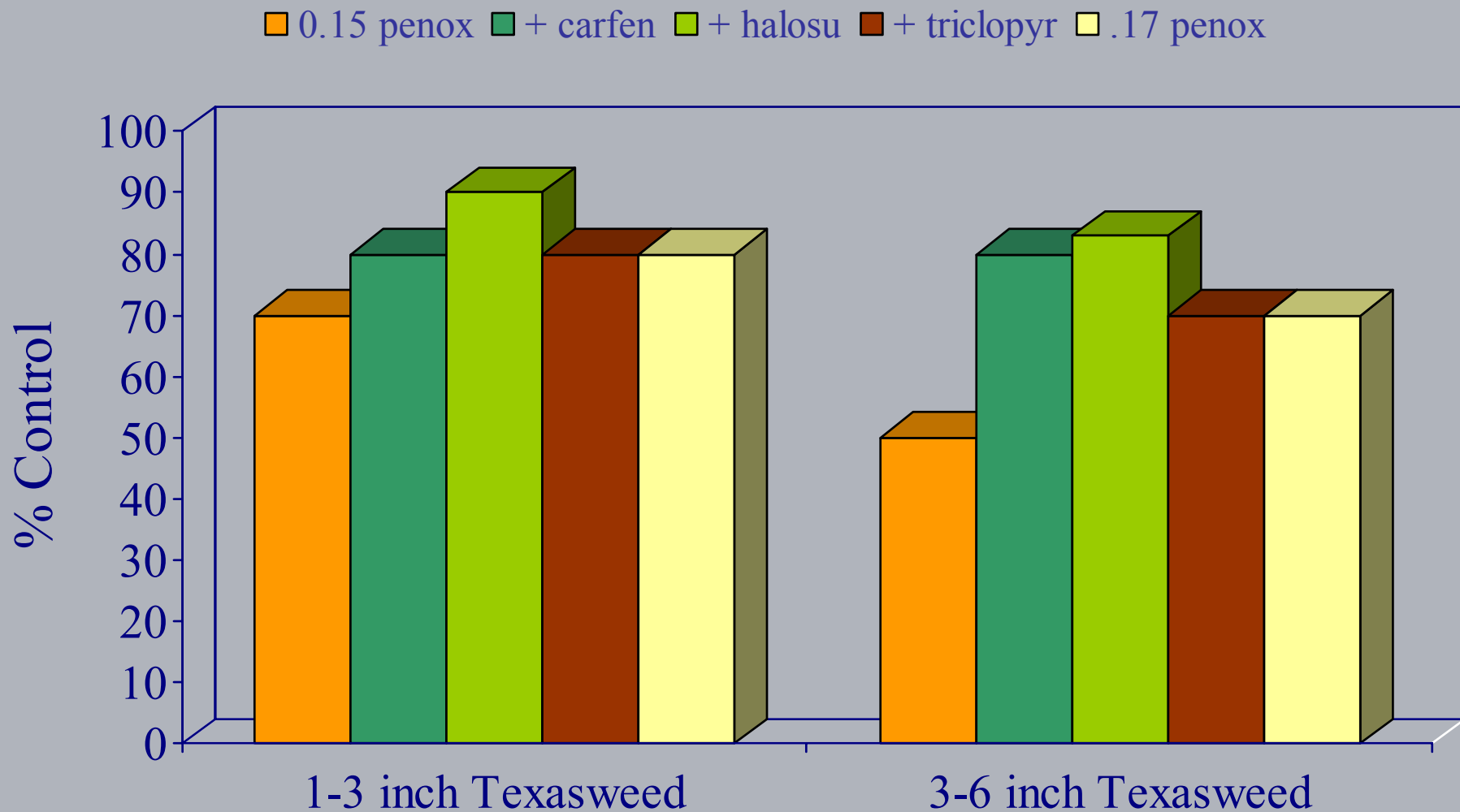


Figure 1. Late season Texasweed control with 0.15 L/ha penoxsulam applied alone and with 0.11 L/ha carfentrazone, 25 g/ha halosulfuron or 0.58 L/ha triclopyr and 0.17 L/ha penoxsulam applied alone.

0.15 penox + carfen + halosu + triclopyr .17 penox

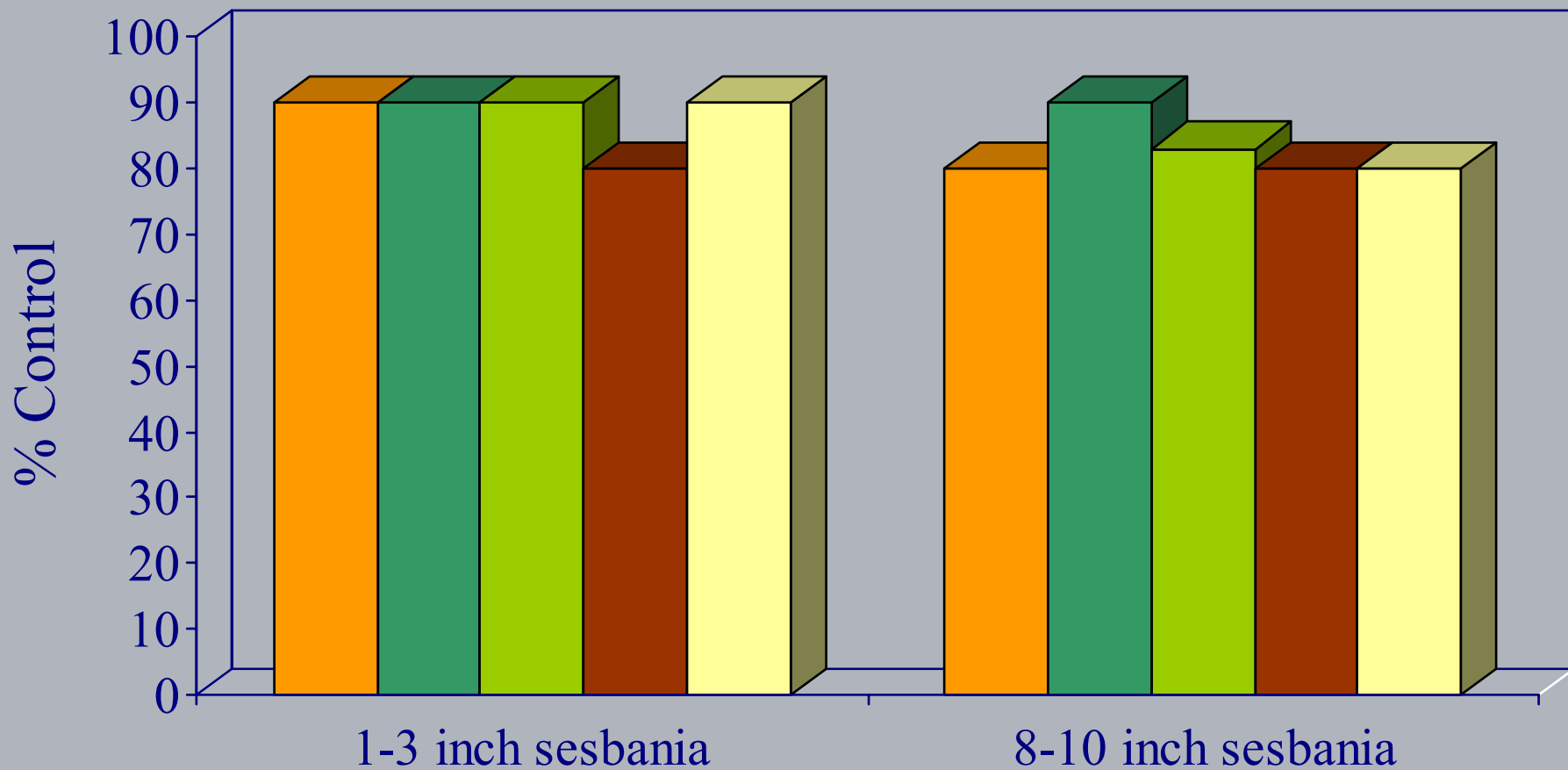


Figure 2. Late season hemp sesbania control with 0.15 L/ha penoxsulam applied alone and with 0.11 L/ha carfentrazone, 25 g/ha halosulfuron or 0.58 L/ha triclopyr and 0.17 L/ha penoxsulam applied alone.

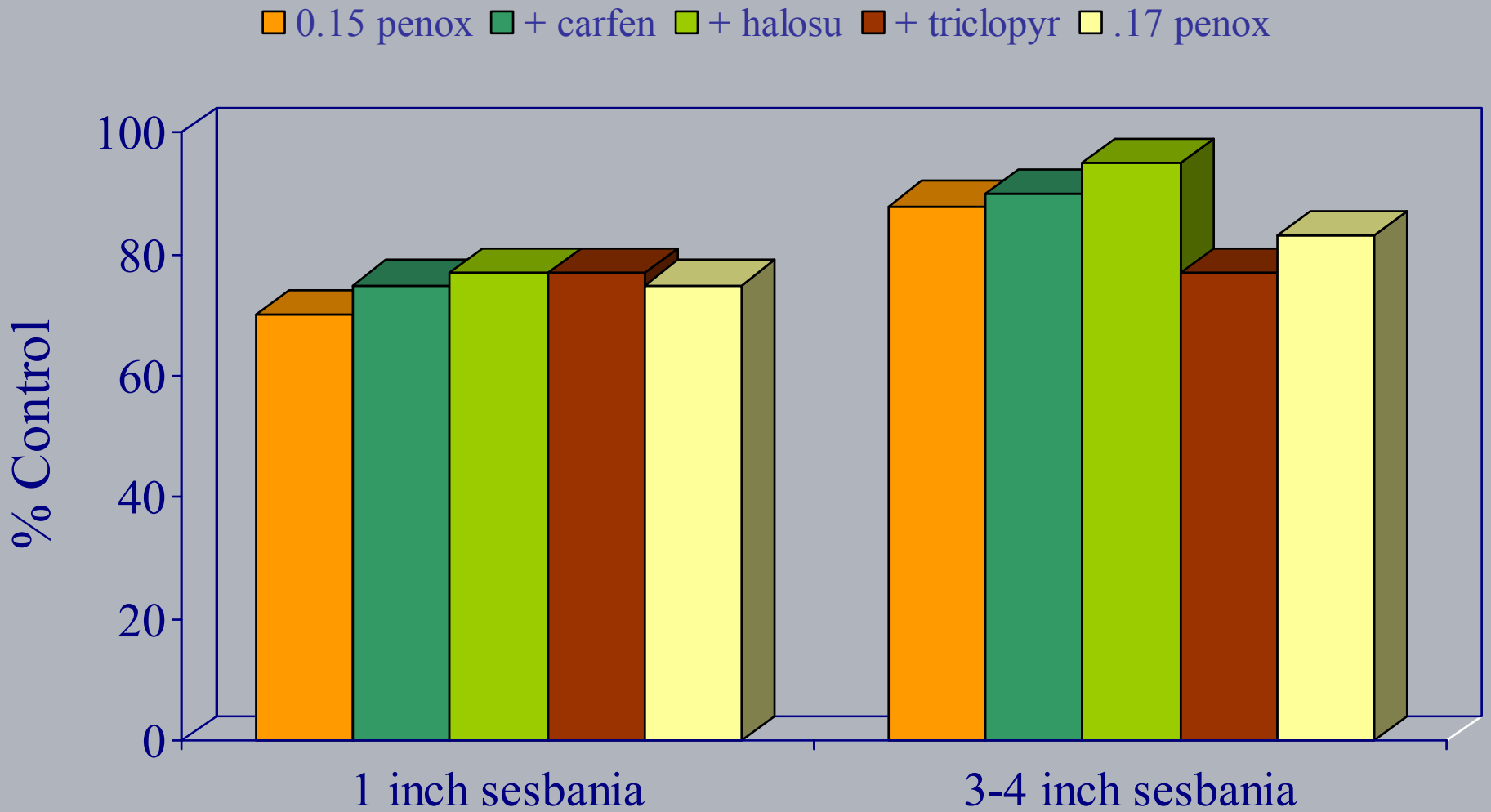


Figure 3. Late season hemp sesbania control with 0.15 L/ha penoxsulam applied alone and with 0.11 L/ha carfentrazone, 25 g/ha halosulfuron or 0.58 L/ha triclopyr and 0.17 L/ha penoxsulam applied alone.

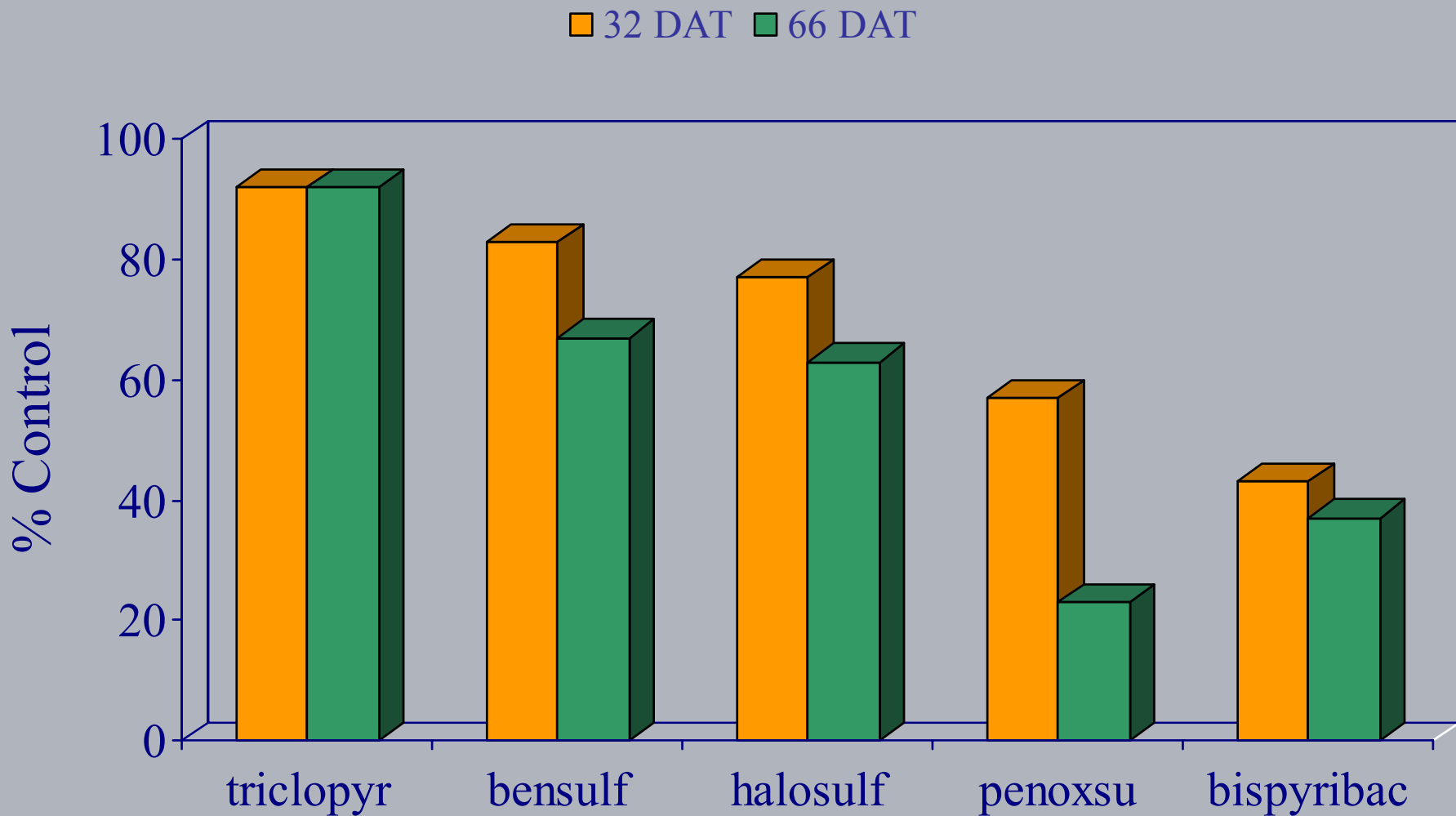


Figure 4. Control of 3 inch Texasweed with 0.8 L/ha triclopyr, 70 g/ha bensulfuron, 70 g/ha halosulfuron, 0.185 L/ha penoxsulam and 35 g/ha bispyribac-sodium

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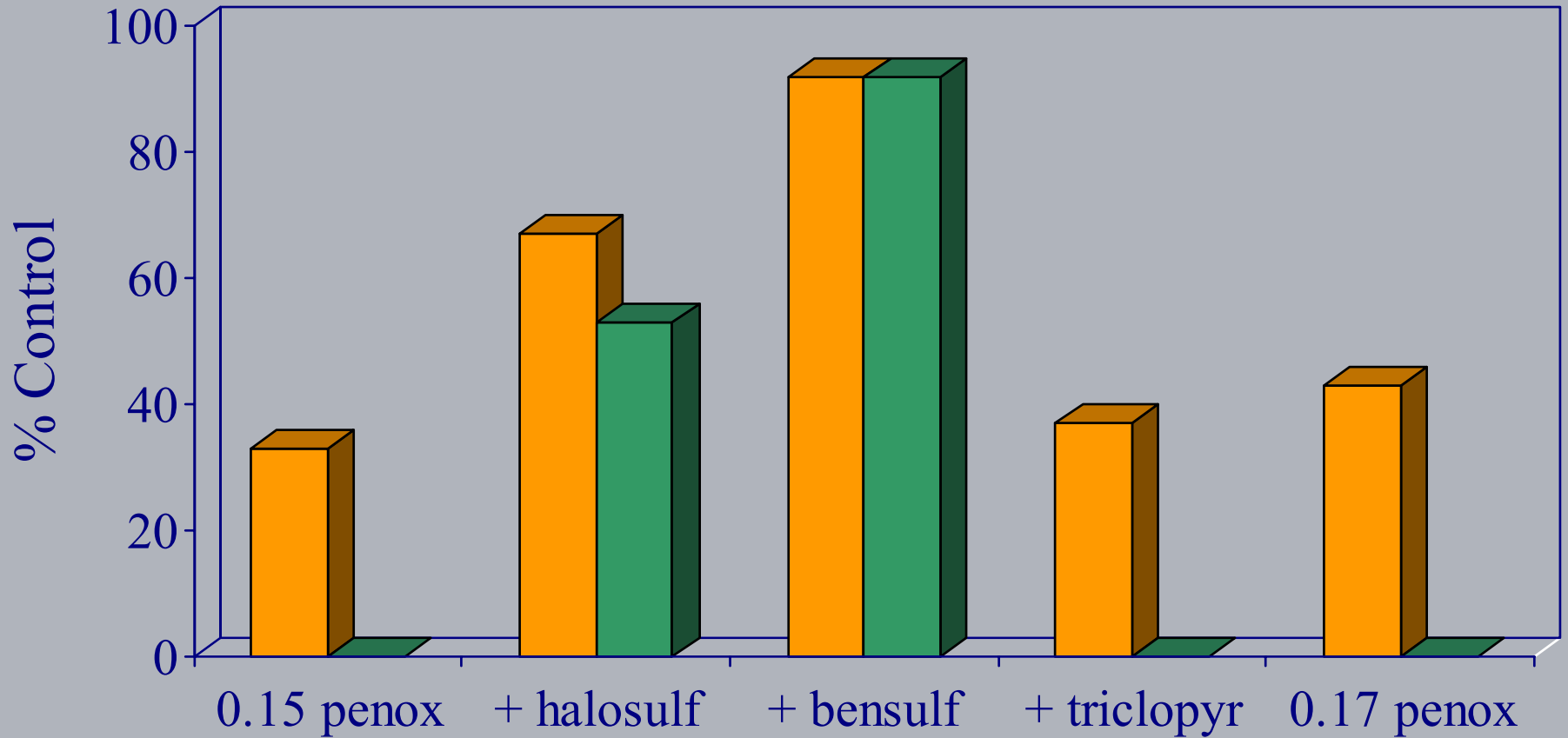


Figure 5. Control of 3 inch Texasweed with 0.15 L/ha penoxsulam alone, 0.15 L/ha penoxsulam mixed 35 g/ha halosulfuron, 52.5 g/ha bensulfuron or 0.58 L/ha triclopyr, and 0.17 L/ha penoxsulam applied alone.

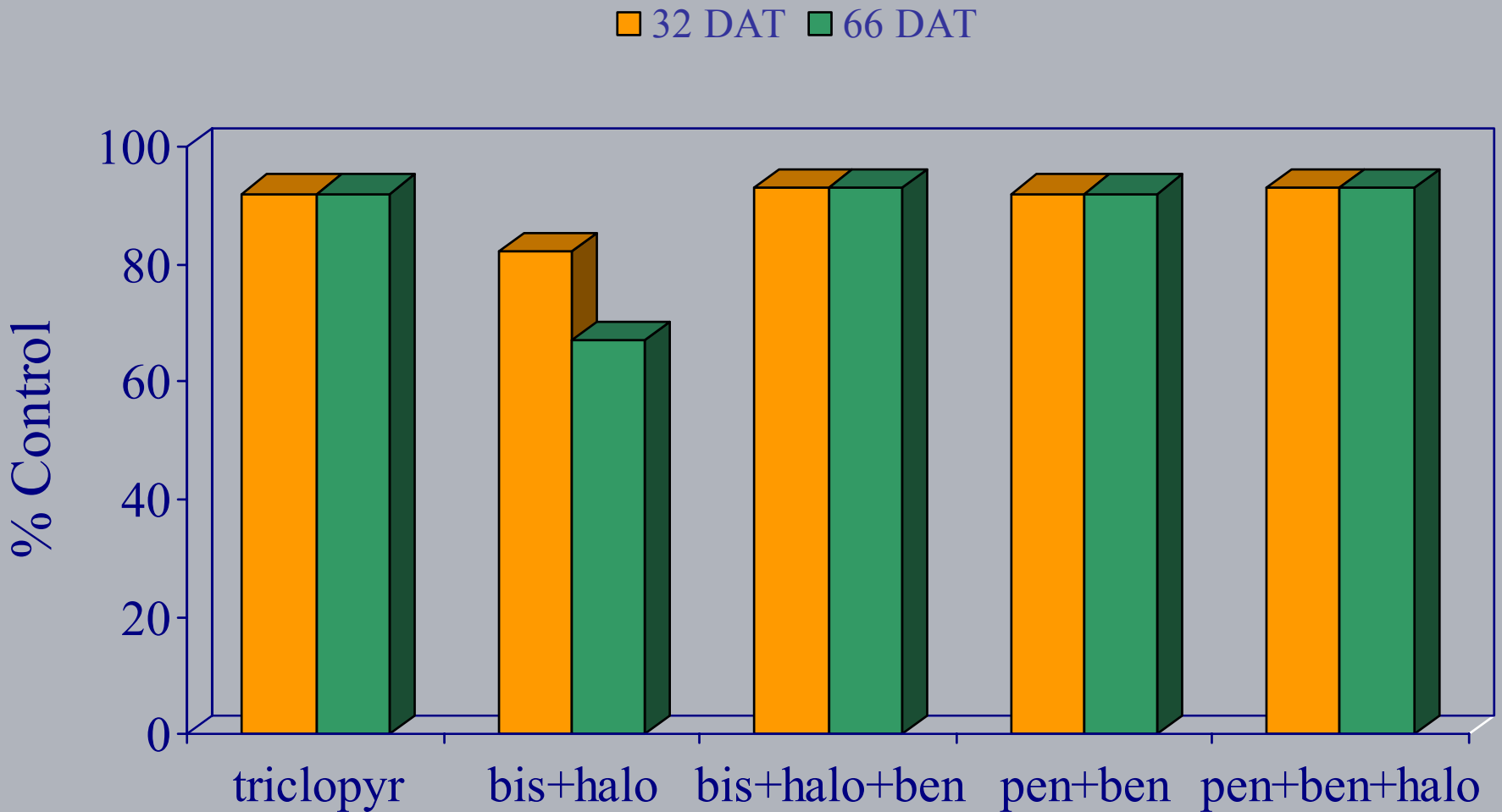


Figure 6. Comparison of standard broadleaf weed control programs for controlling 3 inch Texasweed. The programs evaluated are 0.8 L/ha triclopyr, 35 g/ha bispyribac-sodium plus 35 g/ha halosulfuron, 35 g/ha bispyribac-sodium plus 52.5 g/ha bensulfuron plus 17.5 g/ha halosulfuron, 0.15 L/ha penoxsulam plus 52.5 g/ha bensulfuron , and 0.15 L/ha penoxsulam 52.5 g/ha bensulfuron plus 17.5 g/ha halosulfuron.

■ imazethapyr ■ penox w/1st appl. ■ penox w/2nd appl.

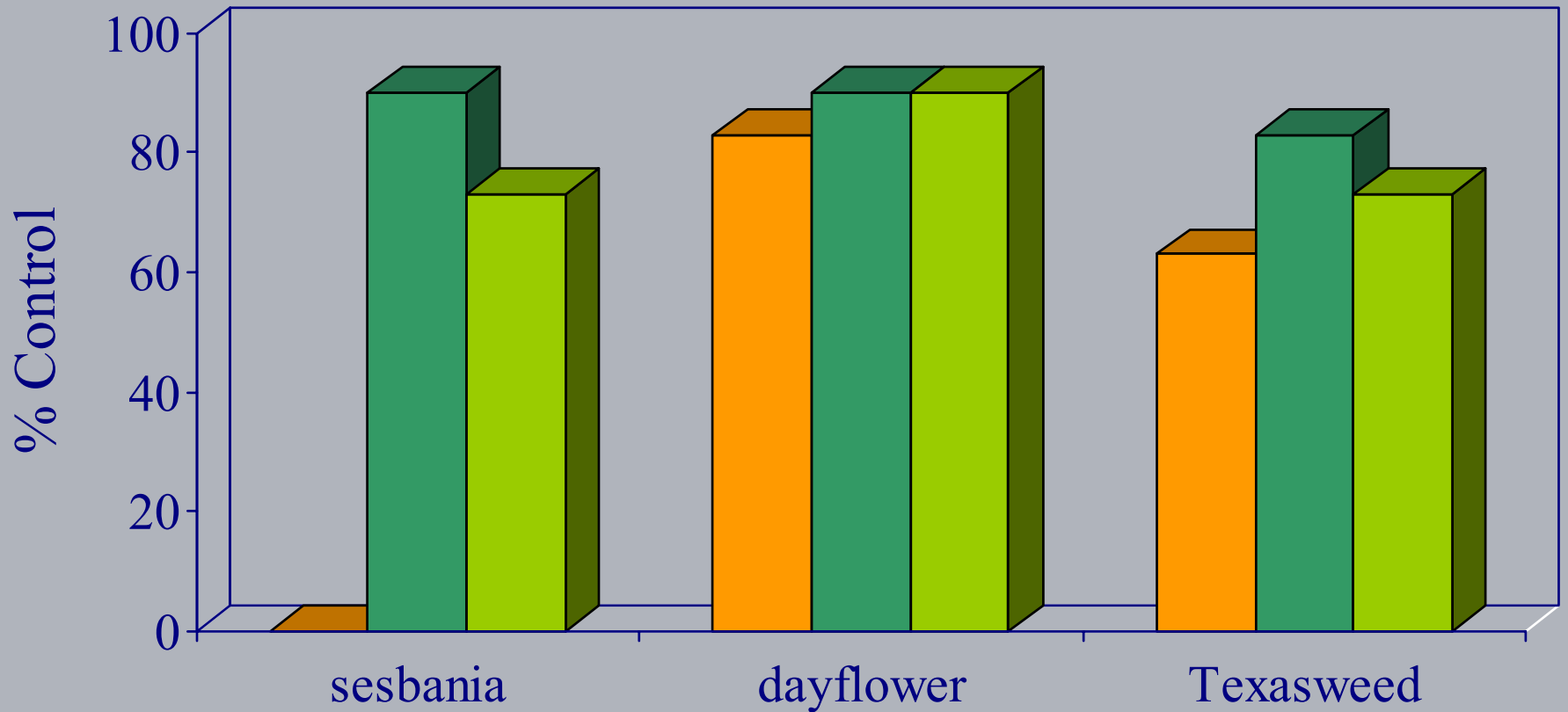


Figure 7. Broadleaf weed control from sequential (1-2 lf followed by 4-5 lf) imazethapyr applications at 0.3 L/ha each and when 0.15 L/ha penoxsulam was mixed with imazethapyr in the first or second application.

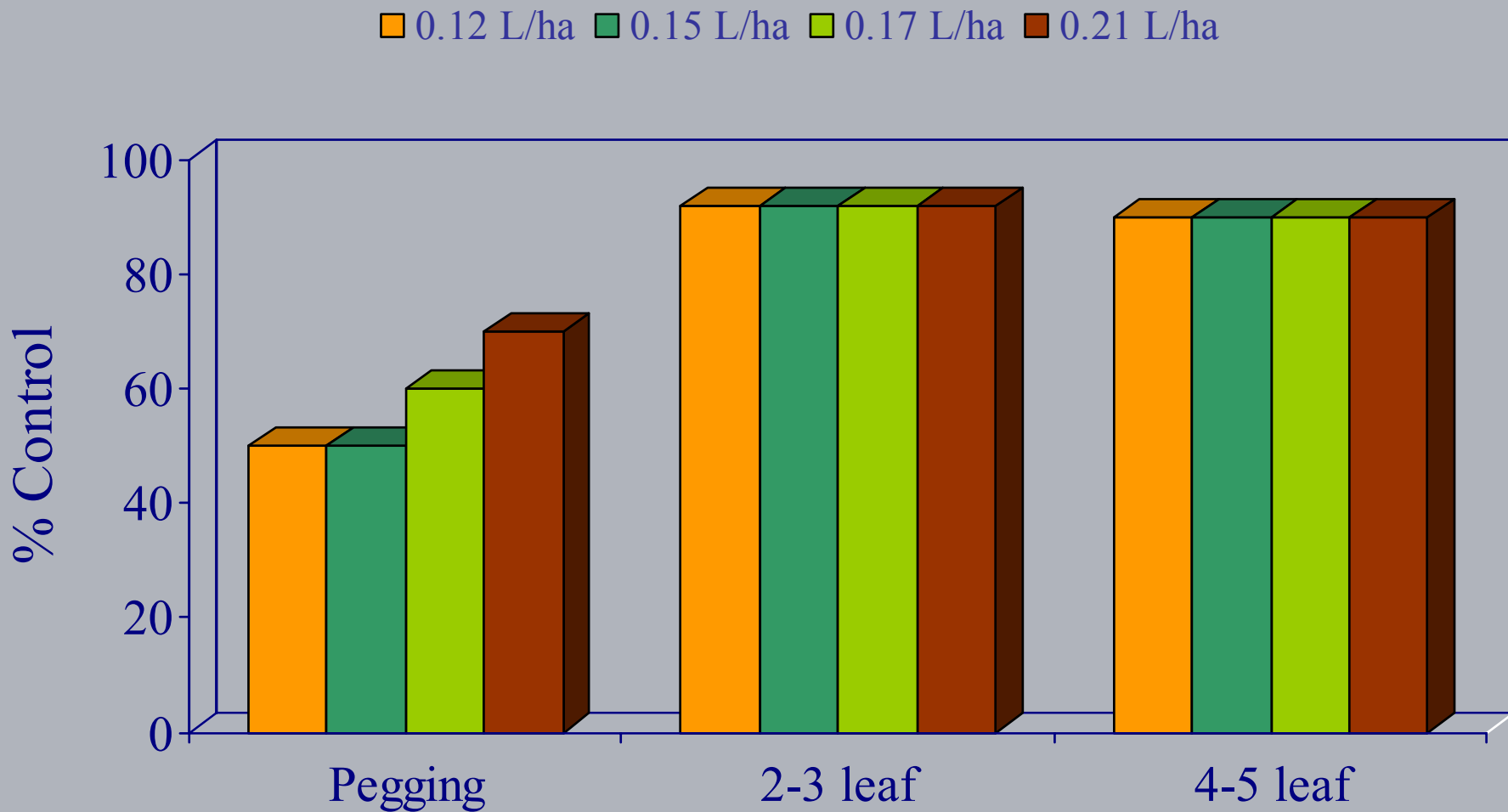


Figure 8. Hemp sesbania control in water-seeded rice as affected by penoxsulam application timing and rate.

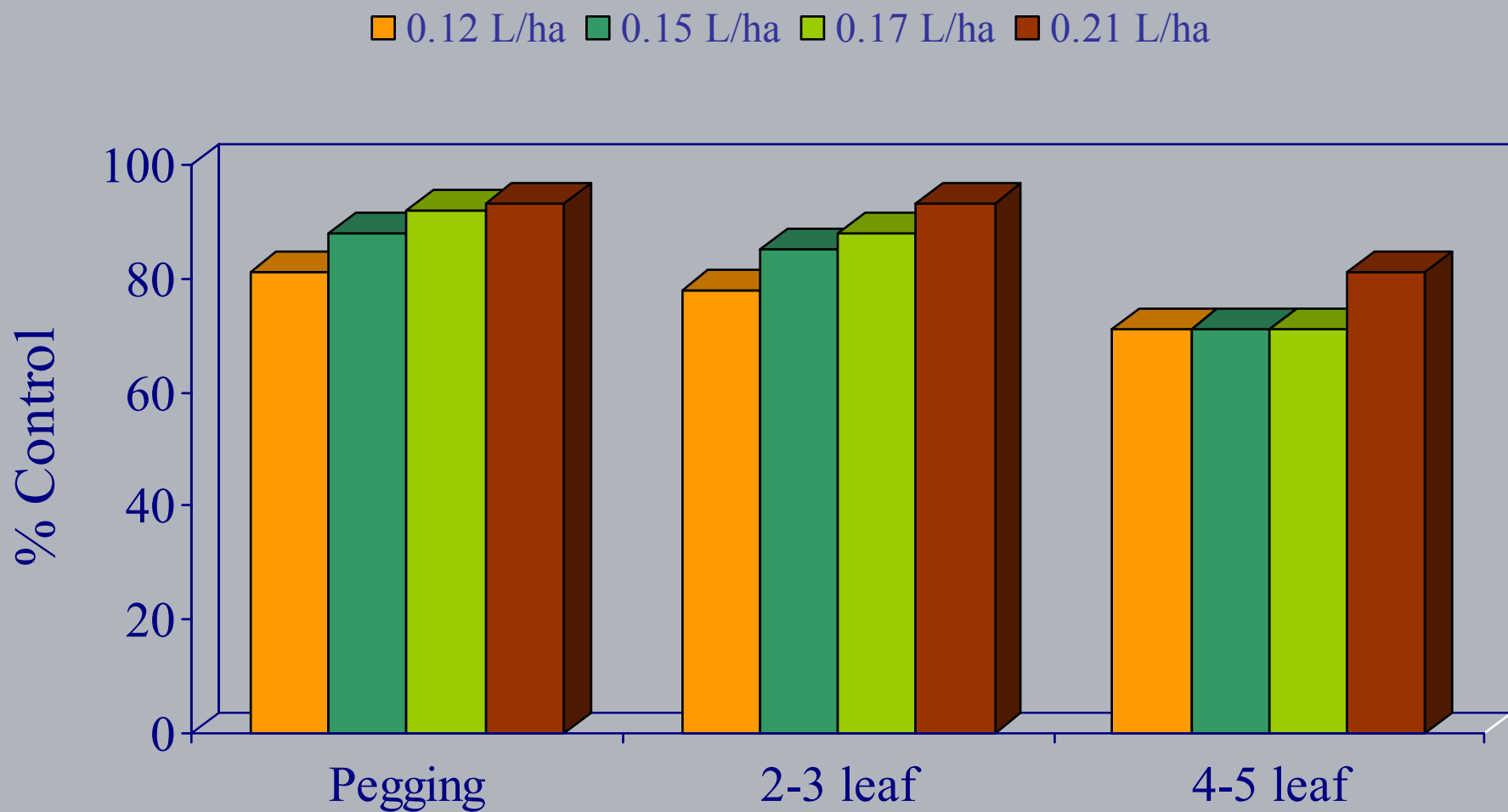


Figure 9. Ducksalad control in water-seeded rice as affected by penoxsulam application timing and rate.

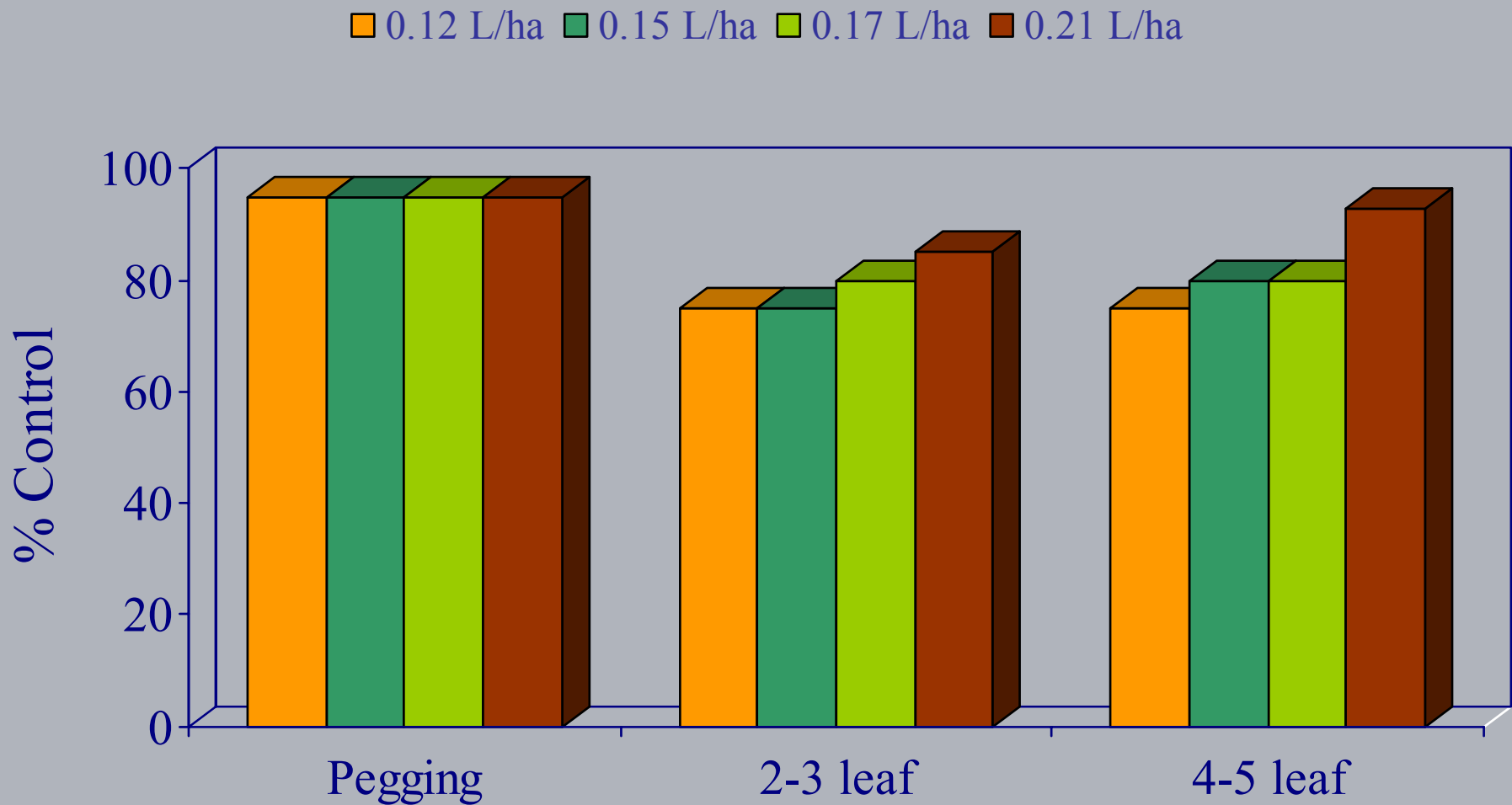


Figure 10. Purple ammannia control in water-seeded rice as affected by penoxsulam application timing and rate.

SUMMARY/CONCLUSIONS

- Penoxsulam has some activity on small Texasweed. However, Texasweed control is improved dramatically when penoxsulam is applied with halosulfuron or bensulfuron (Figures 1, 4, 5 and 6). Additional rates and timings for combinations of penoxsulam, halosulfuron and bensulfuron need further evaluation.
- Penoxsulam demonstrated excellent activity on hemp sesbania (Figures 2 and 3). However application timing is critical, sesbania control from penoxsulam applied to 1 leaf sesbania resulted in less control than later timings. The reduced control was likely due to new emergence. As with Texasweed, penoxsulam tank mixes with halosulfuron often improved sesbania control.
- Overall, the best tank mix partners for penoxsulam appear to be halosulfuron and bensulfuron. Carfentrazone also improved sesbania and Texasweed control in certain situations. Penoxsulam mixed with low rates of triclopyr do not appear promising for sesbania (Figure 3) or Texasweed (Figure 5).

- Penoxsulam also appears to be very promising in Clearfield rice programs (Figure 7). Tank mixing penoxsulam with imazethapyr controlled sesbania and improved dayflower and Texasweed control. Penoxsulam did not appear to affect red rice control in 2005 (data not shown). Broadleaf weed control was best when penoxsulam was included in the first imazethapyr application.
- In water-seeded rice, penoxsulam controlled barnyardgrass (data not shown) from pegging through 2-3 lf stage, later timings were less effective. Sesbania control was best at the 2-3 lf timing (Figure 8), while ducksalad and purple ammannia control was best at the pegging stage (Figure 9 and 10).
- Overall, penoxsulam appears to be very promising for controlling broadleaf weeds in conventional and Clearfield rice regardless of the seeding method. Penoxsulam is most effective on small weeds and higher rates (at least 0.17 L/ha) are required for consistent control of weeds larger than 2 to 3 inches. Residual activity on sesbania and Texasweed is limited, so applications are best made as close to permanent flood as possible. At later timings penoxsulam mixes with halosulfuron or bensulfuron will be beneficial, but needs further evaluation.

ACKNOWLEDGEMENTS

- This research was partially supported by the Louisiana Rice Research Board and Dow AgroSciences.

