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Evaluation of Herbicide–Adjuvant Combinations for the Control of Ambrosia artemisiifolia in Sunflower (EXPRESS Hybrid)

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Abstract: This study assessed the efficacy of herbicide–adjuvant combinations targeting Ambrosia artemisiifolia in sunflower (EXPRESS hybrid). Treatments included halauxifen-methyl + tribenuron-methyl

paired with Vivolt, ACTIROB B, or CODACIDE, and halauxifen-methyl alone or combined with tribenuronmethyl. The most effective treatments achieved 90–95% control, emphasizing the importance of optimal herbicide dosing and adjuvant use for enhanced weed management.

• Introduction

Ambrosia artemisiifolia is a highly competitive weed that threatens sunflower yield and crop quality by aggressively colonizing cultivated fields. Effective weed management is essential to minimize yield loss and maintain the agronomic sustainability of sunflower production. This study focuses on optimizing chemical control strategies using specific herbicide–adjuvant combinations to enhance control efficacy against *A. artemisiifolia* under local pedoclimatic conditions.

• Material and method

The field experiment was conducted in Hodoş, Timiş County, Romania, using the EXPRESS sunflower hybrid. The study evaluated key treatment variants applied post-emergence (BBCH 14-16):

 halauxifen-methyl + tribenuron-methyl (50g/ha) + Vivolt (0.1% V/V)

• Results and discussions

The most effective treatment was halauxifen-methyl (1 L/ha) alone, which achieved 95% weed control. Close behind were the combined treatments of halauxifenmethyl (1 L/ha) + tribenuron-methyl (45 g/ha) + Vivolt and halauxifen-methyl + tribenuron-methyl (50 g/ha) + CODACIDE, both reaching 87.5–90% efficacy. Treatments with Vivolt or ACTIROB B as adjuvants and lower herbicide doses yielded moderate control levels (80–85%), indicating the critical role of both dosing and adjuvant type in maximizing herbicidal efficacy.

• Conclusions

The findings underline the importance of integrating optimized herbicide doses with high-quality adjuvants for effective Ambrosia artemisiifolia management in sunflower crops. The best results were obtained either by using halauxifen-methyl alone at full dose or by pairing it with tribenuronmethyl and adjuvants such as Vivolt or CODACIDE.

- halauxifen-methyl + tribenuron-methyl (50g/ha) + ACTIROB B (0.5 L/ha)
- halauxifen-methyl + tribenuron-methyl (50g/ha) + CODACIDE (1L/ha)
- halauxifen-methyl (1L/ha)
- halauxifen-methyl (1L/ha) + tribenuron-methyl (45g/ha)
 + Vivolt (0.1% V/V)

Applications were carried out with a manual sprayer (500 kPa, 250 L/ha). Weed control efficacy was assessed in accordance with EPPO standards at several intervals post-treatment. Efficacy was assessed at 3, 7, 14, 21, and 50 days after treatment, with key evaluations at 7, 14, and 44 days used for final analysis.



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