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# Journée des Doctorants

Lundi 14 Mars (9 h -14h)

Amphi Ampère – Bât. Gabriel

Au programme : 8 posters, 11 présentations orales dont 1 invité surprise + 1 buffet

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## **The herbicide safener cloquintocet-mexyl reduces rye-grass (*Lolium sp.*) sensitivity to an ALS inhibitor and regulates candidate non-target-site-based resistance genes.**

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Safeners enable selective control of weeds in botanically related crops by enhancing or triggering herbicide degradation in crop plants *via* mechanisms very similar to mechanisms involved in weed non-target-site-based resistance (NTSR). To assess whether safeners could play a role in NTSR evolution, we investigated the effect of the safener cloquintocet-mexyl on plant phenotype and on the expression level of 19 candidate NTSR genes in *Lolium sp.*. Twelve plants in each of three populations were split into 14 tillers each. Tillers from each plant was used in the following modalities: water (control, 2 tillers), Actirob B (adjuvant, 2 tillers), cloquintocet-mexyl, pyroxsulam+Actirob (4 tillers), cloquintocet-mexyl+pyroxsulam+Actirob (4 tillers) applied using a custom-built, single-nozzle (110-04, Albus, France) sprayer delivering herbicide in 300L/ha water at 400kPa (6.6km/h, 23°C, relative humidity 80%). Actirob B (1L/ha), pyroxsulam (18.75g/ha) and cloquintocet-mexyl (18.75g/ha) were at the recommended field rate in every modality. Two tillers per plant and per modality were collected 24hours after application to measure the expression of the candidate NTSR genes. The effect of cloquintocet-mexyl on plant phenotype was rated 4 weeks after application using the additional 2 tillers in the last two modalities. Cloquintocet-mexyl reduced the sensitivity of some plants. A significant up-regulation of 8 candidate NTSR genes was observed 24hours after application of cloquintocet-mexyl alone. Plants showing a decrease in sensitivity when cloquintocet-mexyl was sprayed with pyroxsulam showed a higher up-regulation than other plants in modalities including cloquintocet-mexyl. An additive effect of pyroxsulam and cloquintocet-mexyl was observed on most genes regulation, with a relative effect of cloquintocet-mexyl up to 48%. We demonstrated that cloquintocet-mexyl can modify herbicide sensitivity and regulate genes potentially involved in NTSR in *Lolium sp.*.

Key words : resistance, stress, genic expression, ray-grass and safner