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Effect of herbicide clopyralid and imazamox on dehydrogenase enzyme in soil of regenerated pedunculate oak forests. Scientific work of category M21

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Clopyralid and imazamox are successfully used for weed control during the first years of regeneration of pedunculate oak forests. Hence, the question that arises is how these herbicides affect microorganisms, especially the activity of dehydrogenase enzyme, when they reach the soil. Two study sites were selected in regenerated pedunculate oak forests, and the two herbicides were applied in two doses that are used for weed control (clopyralid, 100 g a.i. ha⁻¹ and 120 g a.i. ha⁻¹; imazamox, 40 g a.i. ha⁻¹ and 48 g a.i. ha⁻¹). The effect of the herbicides was evaluated 7, 14, 21, 30, and 60 days after application. A significant reduction in dehydrogenase activity was found on days 7 and 14 at both sites. However, after 14 days there was a recovery of dehydrogenase activity for all treatments such that the values obtained on day 21 did not differ from the control values. The effect of clopyralid and imazamox on dehydrogenase activity was not dose-dependent. Dehydrogenase activity also depended on soil properties, soil sampling time and climatic conditions during the investigation years. The results show that clopyralid and imazamox can reduce soil dehydrogenase activity, but this effect is transient. This can be attributed to the ability of microorganisms to overcome the stress caused by the herbicide by developing the capability to utilize herbicides as a nutrient source and proliferating in such an environment.

