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# DEVELOMPENT OF STRATEGIES FOR THE CONTROL OF *CHENPODIUM ALBUM* BIOTYPES WITH REDUCED METAMITRON SENSIVITY IN DIFFERENT EUROPEAN COUNTRIES

**Mise au point de stratégies afin de contrôler des biotypes de *Chenopodium album* à sensibilité réduite au Metamitron dans différents pays européens / Entwicklungen von Strategien zur Kontrolle von *Chenopodium album*-Biotypen mit reduzierter Empfindlichkeit gegenüber Metamitron in verschiedenen europäischen Ländern**

## ABSTRACT

The resistance in *Chenopodium album* against Photosystem II inhibitors like Triazines and Triazinones is determined by a target site resistance against herbicidal compounds from HRAC group C1 in the psbA-gene. *C. album* represents a major weed in many sugar beet growing areas with high persistance. Although mediating only low resistance factors, these mutations lead to inappropriate control with these compounds. To date a total of three different psbA mutations were identified in *C. album* leading to amino acid exchanges in the D1 chloroplast protein (Serin-264-Glycin (S264G), Alanin-251-Valin (A251V) and Leucin-218-Valin (L218V). In fields with natural occurrence of mutant *C. album* populations, herbicide strategies for effective control of these biotypes were aimed to be developed. In two years in seven environments (NL, B, S and D) herbicide trials were performed. The proportion of the mutant biotype in the soil seed bank was determined and displayed high variation (13-80%). Independant of environment and *C. album* biotype the maximal registered dose of Metamitron (3.500 g/ha), did not results in sufficient control. By addition of Phenmedipham (PMP) und Ethofumesat (Etho) the efficacy was significantly improved. However the combination of Metamitron (3.500 g/ha) and Etho (1.000 g/ha), as well as PMP (960 g/ha) plus Etho (1.000 g/ha) on most locations did not result in efficient control. Reduction below the maximum registered doses as well led to herbicide failure. Taken together it was demonstrated that Metamitron, due to the relative low resistance factor, retained some residual efficacy against *C. album* biotypes with different psbA mutations which was required for effective control in combination with PMP (PSII-inhibitor) und Etho (Lipid-biosynthesis inhibitor). Further it was shown that all biotypes were effectively controlled with this strategy. The missing sensitivity against Metamitron was effectively complemented by compounds with deviating mode of action. This study is a joint project of COBRI.