

ACETOLACTATE SYNTHASE ACTIVITIES AND AMINO ACID LEVELS IN BENSULFURON METHYL RESISTANT PLANT CELLS

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Selection of cultured plant cells resistant to bensulfuron methyl (BSM) and BSM effects on acetolactate synthase (ALS) activity and amino acid level were investigated to clarify their resistance mechanism.

BSM severely inhibited growth and ALS activity of suspension cultured rice and carrot cells. Rice and carrot cells resistant to 1-10 μM and 10 μM BSM, respectively, were stepwise selected after culturing in the media containing the herbicide. These resistances were kept stable for more than a year in BSM-free media. During and even after selection, ALS from these resistant cells became far less sensitive to the herbicide and was over 1000 and 60 times less inhibited than in susceptible cells, respectively. Levels of branched-chain amino acids in the resistant cells were considerably higher than in susceptible cells. BSM greatly affected amino acid levels, especially decreasing branched-chain amino acids and soluble protein levels, while BSM had little effect in the resistant cells.

These results might be due to the development of ALS being insensitive to BSM, or less sensitive to feedback inhibition as well, which may be involved in the resistance mechanism.

EFFECT OF AERIAL WATER VOLUME ON TRICLOPYR/PICLORAM APPLIED TO RUBBER VINE (*CRYPTOSTEGIA GRANDIFLORA*)

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Rubber vine mortality with triclopyr/picloram (Grazon DS) + 2 mL organosilicone (Pulse)/L spray volume was evaluated to determine the optimum carrier water volume for aerial application using a jet ranger helicopter. Low volume sprays (100-150 L/ha) generally used for woody weed control, achieve excellent brown out but can result in poor plant mortality. Applying triclopyr/picloram at the registered aerial rate of 900 g triclopyr/300 g picloram/ha and varying the spray volume applied of 50, 100, 200 and 400 L/ha killed 30, 54, 68 and 98% of the treated plants respectively. Rubber vine control was similar (approximately 95% mortality) when the herbicide was applied at 900/300 g/ha with a spray volume of 400 L/ha and 4800/1600 g/ha with a spray volume of 200 L/ha. Initial trials indicate that aerial spray volume influences rubber vine mortality. Further research to find the optional aerial water volume to maximise herbicide efficacy would minimise the cost for effective woody weed control.