

Year	Num	Title	Author
2009	69	A W574L mutation in the ALS enzyme from <i>Bidens subalternans</i> from Brazil and consequences to the fitness of ALS-resistant and susceptible biotypes.	F. P. Lamego, ¹ R. A. Vidal*, ¹ N. Burgos, ² V. Shivrain, ² M. Sales ² ; ¹ UFRGS, Porto Alegre, Brazil, ² Arkansas University, Fayetteville, AR

The first publication of herbicide resistance in Brazil was about a dozen years ago. Nowadays, there are 24 cases of herbicide-resistant weeds with thousands of infested fields, but, no report on the resistance mechanism in broadleaf weeds. The majority of resistance occur in soybean with ALS inhibitors. *Bidens subalternans* is a polyploid species and one of the most troublesome weeds in soybean fields in Brazil. The objective of this work was to characterize the resistance at of *B. subalternans* to ALS inhibitors. Experiments at the whole plant level and enzyme bioassays of an ALS-R biotype from Goiás, Brazil, have shown high levels of resistance. To investigate the molecular basis of resistance in *B. subalternans*, the conserved regions of ALS gene in susceptible and resistant biotypes were sequenced and compared. *B. subalternans* harbors, at least, three alleles for ALS gene. Analysis of the nucleotide and amino acid sequences demonstrated that a single-point mutation from G to T in one ALS allele conferred the change from the amino acid tryptophan to leucine at position 574 in the resistant biotype. Two other substitutions were observed, Phe116Leu and Phe149Ser, in the ALS3 gene of the R biotype, but were not associated previously with resistance to ALS herbicides. This research elucidated for the first time the molecular basis of resistance to herbicides in an important polyploid weed species from Brazil.