**Protein structure**

The acetolactate synthase (ALS) enzyme (also known as acetohydroxy acid or acetohydroxyacid synthase, abbr. AHAS) is a protein found in plants and micro-organisms. ALS catalyzes the first step in the synthesis of the branched-chain amino acids.

Chlorsulfuron is an ALS (acetolactate synthase) inhibitor herbicide and is a sulfonylurea compound. (Used herbicide).

Below point, mutation makes the plants resistant against herbicides. 61 58 57 2

**Resistance Plant (ALS enzyme Red point mutation)**

MAATASRTTRFSSSSSHPTFPKRITRSTLPLSHQTLTKPNHALKIKCSISKPPTAAPFTKEAPTTEPFVSRFASGEPRKGADILVEALERQGVTTVFAYPGGASMEIHQALTRSAAIRNVLPRHEQGGVFAAEGYARSSGLPGVCIATSGPGATNLVSGLADALMDSVPVVAITGQVSRRMIGTDAFQETPIVEVSRSITKHNYLILDVDDIPRVVAEAFFVATSGRPGPVLIDIPKDVQQQLAVPNWDEPVNLPGYLARLPRPPAEAQLEHIVRLIMEAQKPVLYVGGGSLNSSAELRRFVELTGIPVASTLMGLGTFPIGDEYSLQMLGMHGTVYANYAVDNSDLLLAFGVRFDDRVTGKLEAFASRAKIVHIDIDSAEIGKNKQAHVSVCADLKLALKGINMILEEKGVEGKFDLGGWREEINVQKHKFPLGYKTFQDAISPQHAIEVLDELTNGDAIVSTGVGQHQMWAAQFYKYKRPRQWLTSGGLGAMGFGLPAAIGAAVANPGAVVVDIDGDGSFIMNVQELATIRVENLPVKILLLNNQHLGMVVQWEDRFYKSNRAHTYLGDPSSESEIFPNMLKFADACGIPAARVTKKEELRAAIQRMLDTPGPYLLDVIVPHQEHVLPMIPSNGSFKDVITEGDGRTRY

**Susceptible Plant**

MAATASRTTRFSSSSSHPTFPKRITRSTLPLSHQTLTKPNHALKIKCSISKPPTAAPFTKEAPTTEPFVSRFASGEPRKGADILVEALERQGVTTVFAYPGGASMEIHQALTRSAAIRNVLPRHEQGGVFAAEGYARSSGLPGVCIATSGPGATNLVSGLADALMDSVPVVAITGQVPRRMIGTDAFQETPIVEVSRSITKHNYLILDVDDIPRVVAEAFFVATSGRPGPVLIDIPKDVQQQLAVPNWDEPVNLPGYLARLPRPPAEAQLEHIVRLIMEAQKPVLYVGGGSLNSSAELRRFVELTGIPVASTLMGLGTFPIGDEYSLQMLGMHGTVYANYAVDNSDLLLAFGVRFDDRVTGKLEAFASRAKIVHIDIDSAEIGKNKQAHVSVCADLKLALKGINMILEEKGVEGKFDLGGWREEINVQKHKFPLGYKTFQDAISPQHAIEVLDELTNGDAIVSTGVGQHQMWAAQFYKYKRPRQWLTSGGLGAMGFGLPAAIGAAVANPGAVVVDIDGDGSFIMNVQELATIRVENLPVKILLLNNQHLGMVVQWEDRFYKSNRAHTYLGDPSSESEIFPNMLKFADACGIPAARVTKKEELRAAIQRMLDTPGPYLLDVIVPHQEHVLPMIPSNGSFKDVITEGDGRTRY

**NP\_190425.1 Arabidopsis thaliana AHAS gene Region protein sequence**

MAAATTTTTTSSSISFSTKPSPSSSKSPLPISRFSLPFSLNPNKSSSSSRRRGIKSSSPSSISAVLNTTTNVTTTPSPTKPTKPETFISRFAPDQPRKGADILVEALERQGVETVFAYPGGASMEIHQALTRSSSIRNVLPRHEQGGVFAAEGYARSSGKPGICIATSGPGATNLVSGLADALLDSVPLVAITGQVPRRMIGTDAFQETPIVEVTRSITKHNYLVMDVEDIPRIIEEAFFLATSGRPGPVLVDVPKDIQQQLAIPNWEQAMRLPGYMSRMPKPPEDSHLEQIVRLISESKKPVLYVGGGCLNSSDELGRFVELTGIPVASTLMGLGSYPCDDELSLHMLGMHGTVYANYAVEHSDLLLAFGVRFDDRVTGKLEAFASRAKIVHIDIDSAEIGKNKTPHVSVCGDVKLALQGMNKVLENRAEELKLDFGVWRNELNVQKQKFPLSFKTFGEAIPPQYAIKVLDELTDGKAIISTGVGQHQMWAAQFYNYKKPRQWLSSGGLGAMGFGLPAAIGASVANPDAIVVDIDGDGSFIMNVQELATIRVENLPVKVLLLNNQHLGMVMQWEDRFYKANRAHTFLGDPAQEDEIFPNMLLFAAACGIPAARVTKKADLREAIQTMLDTPGPYLLDVICPHQEHVLPMIPSGGTFNDVITEGDGRIKY