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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Herbicide name | Persian name | Toxicity | GM plants | Gene(s) introduced | method | Ref (protocol folder) | Source | Positive Points |
| Imazamox | پرسوئیت | Low toxicity | Canola | *AtAHAS* or ALS | Single point **mutations** in the target AHAS (or ALS) gene that reduce AHAS sensitivity | 1 (Rice,PCR-2018)/  2 (Canola, CRISPR-2020)/  3 (Canola, analysis-2018)/  4 (Canola, analysis-2020)/  13(Soybean,analysis-2013)  15  16  19(vector ord) | *Arabidopsis thaliana*  *Brassica napus* | More than 50 ALS inhibitors have been discovered that fall in **five** chemical classes: 1.sulfonylurea, 2.imidazolinones, 3.triazolopyrimidines, 4.pyrimidinylthiobenzoates, 5.sulfonylamino-carbonyl triazolinones  Broad spectrum weed control at very low rates,  low mammalian toxicity  Wide crop selectivity. |
| Isoxaflutole | ایزوکسافلوتل | Medium toxicity | Cotton  Soybean | *hppd* | Site directed **mutation** in and gene transformation | 7(plants-2005)  6 (soybean,analysis-2018) | *Pseudomonas fluorescens*  (Available in IBRC) | Vitamin E enhancement |
| Mesotrione | مزوتریون | Soybean | Single point **mutations** | **5**(Soybean, analysis-2019)  8,9,10,11(patent-2007,2012,2014,2018) | *Avena Sativa*  (Available in Sari!) | Recently published data |
| Glufosinate | باستا | High toxicity | Canola | *bar* | Gene transformation | 17(B.napus-1989)  1 (Rice,PCR-2018) | *Streptomyces hygroscopicus*  (available in IBRC) | 615 bp |

**Non-selective herbicides**

**Broad-leaf weed herbicides**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Herbicide name | Persian name | Toxicity | GM plants | Gene(s) introduced | method | Ref (protocol folder) | Source | Positive Points |
| Oxynil  (bromoxynil) | برموکسینیل | Medium toxicity | Canola  Cotton  Tobacco | *bxn* | Gene transformation | 14(1988)  18(review-2012) | *Klebsiella pneumoniae subsp. Ozaenae*  (available in IBRC) | Available source |