

HRAC Mode of Action Classification 2022

Revised January 2022



HERBICIDE RESISTANCE ACTION COMMITTEE

Light Activation of ROS^a

Inhibition of Photosynthesis at PS II

5 D1 Serine 264 binders (and other non-histidine 215 binders)

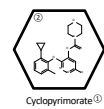
6 D₂ Histidine 215 binders

14 Inhibition of Protoporphyrinogen Oxidase

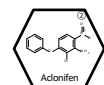
10 Inhibition of Glutamine Synthetase

22 PS I Electron Diversion

33 Inhibition of Homogentisate Solanessyltransferase



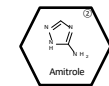
32 Inhibition of Solanessyl Diphosphate Synthase



12 Inhibition of Phytoene Desaturase

13 Inhibition of Deoxy-D-Xylulose Phosphate Synthase

34 Inhibition of Lycopene Cyclase



Cellular Metabolism

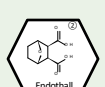
2 Inhibition of Acetolactate Synthase

1 Inhibition of Acetyl CoA Carboxylase

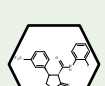
15 Inhibition of Very Long-Chain Fatty Acid Synthesis

29 Inhibition of Cellulose Synthesis

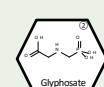
31 Inhibition of Serine Threonine Protein Phosphatase



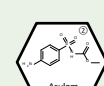
28 Inhibition of Dihydroorotate Dehydrogenase



9 Inhibition of Enolpyruvyl Shikimate Phosphate Synthase



18 Inhibition of Dihydropterotate Synthase



Cell Division and Growth

3 Inhibition of Microtubule Assembly

23 Inhibition of Microtubule Organization

4 Auxin Mimics

19 Auxin Transport Inhibitors

∅ Unknown Mode of Action

HRAC	Legacy HRAC	Mode of Action	HRAC	Legacy HRAC	Mode of Action
1	A	Inhibition of ACCase	19	P	Auxin transport inhibitors
2	B	Inhibition of ALS	22	D	PS I electron diversion
3	K1	Inhibition of microtubule assembly	23	K2	Inhibition of microtubule organization
4	O	Auxin mimics	24	M	Uncouplers
5	C1,2	Inhibition of photosynthesis PS II - Serine 264	27	F2	Inhibition of HPPD
6	C3	Inhibition of photosynthesis PS II - Histidine 215	28	none	Inhibition of dihydroorotate dehydrogenase
9	G	Inhibition of EPSP synthase	29	L	Inhibition of cellulose synthesis
10	H	Inhibition of glutamine synthetase	30	Q	Inhibition of fatty acid thioesterase
12	F1	Inhibition of PDS	31	R	Inhibition of serine threonine protein phosphatase
13	F4	Inhibition of DOXP synthase	32	S	Inhibition of solanessyl diphosphate synthase
14	E	Inhibition of PPO	33	T	Inhibition of homogentisate solanessyltransferase
15	K3	Inhibition of VLCFAs	34	F3	Inhibition of lycopene cyclase
18	I	DHP inhibition	∅	Z	Unknown mode of action

^a Reactive oxygen species
¹ Indicates pro-herbicide
² HRAC's recommendation is not to include a chemical family name when there is one active in the family. Actives without chemical family names are indicated with a white background