Site of Action Group	Site of Action	Chemical Family	Active Ingredient	Product Examples (Trade Name*)	Herbicide Injury Symptoms on Soybean
Lipid Synthesis Inhibitors					
1	ACCase Inhibitors	Aryloxphenoxypropionate (fops)	clodinafop	Discover NG	Typically no symptoms on soybeans
			cyhalofop	Clincher	
			fenoxaprop	Ricestar, Teoma, others	
			fluazifop	Fusilade DX	
			quizalofop	Assure II, Targa	
		Cyclohexandedione (dims)	clethodim	Select Max, others	
			sethoxydim	Poast, Poast Plus	
		Phenylpyrazolin	pinoxaden	Axial XL	
Amino Acid Synthesis Inhibitors					
2	ALS Inhibitors	Imidazolnone	imazamox	Raptor, Beyond	In general symtpoms are slow to develop (1 to 2 weeks). Soybean injury range from stunting to death of terminal growing point. Soybean leaves may be yellow in appearance and leaf veination may appear red or purple in color (Figure _____)
			imazapic	Plateau	
			imazaquin	Scepter	
			imazethapyr	Pursuit, Newpath	
		Pyrimidinylthiobenzoic acid	bispyribac	Regiment	
			pyrithiobac	Staple	
		Sulfanylaminocarbonyltriazolinones	flucarbazone	Everst, Pre-Pare	
			propoxycarbazone	Olympus	
			thiencarbazone	compoent of Capreno, others	
		Sulfonylurea	bensulfuron	Londax	
			chlorimuron	Classic	
			chlorsulfuron	Glean	
			foramusulfuron	Option	
			halosulfuron	Permit	
			iodosulfuron	Autumn	
			mesosulfuron	Osprey	
			metsulfuron	Ally	
			niocsulfuran	Accent Q	
			orthosulfamuron	Strada	
			primisulfuron	Beacon	
			prosulfuron	Peak	
			rimsulfuron	Resolve, Matrix	
			sulfosulfuron	Maverick	
			thifensulfruon	Harmony	
			triasulfuron	Amber	
			tribenuron	Express	
			trifolxysulfuran	Envoke	
			trifulusulfuron	Upbeet	
		Triazolopyrimidine	cloransulam	FirstRate	
			florasulam	component of Orion	
			flumetsulam	Python	
			penoxsulam	Grasp	
			pyroxsulam	PowerFlex HL	
9	EPSP Synthase Inhibitor	None accepted	glyphosate	Roundup, Touchdown, etc.	Plant foliage, espcially new growth, will frist yellow and then turn borwn and die within 10 to 14 days after herbicide application
Growth Regulators					
4	T1R1 Auxin Recptors	benzoic acid	dicamba	Banvel, Clarity, etc	Stem twisting (Epinasty), callus tissue formation and leaf malformations (cupping, crinkling, parallel veins, leaf strapping)
		Carboxylic acid	clopyralid	Stinger	
			fluroxpyr	Starane	
			triclopyr	Grandstand	
			quinclorac	Facet, Paramount	
		Phenoxy	2, 4-D	2,4-D, others	
			MCPA	MCPA, others	
19	Auxin Transport Inhibitor	Semicarbazone	difludenzopyr	component of Status	
Photosynthesis Inhibitors					
5	Photosynthesis II Inhibitors	Phenylcarbamate	desmedipham	Betenex	These herbicides do not prevent seedlings from germinating or emerginee. Injury symptoms only occur after the cotyledons and first leaves emerge. Initial symptoms include yellowing between the leaf veins (intervienal chlorosis) may occur. Older and larger leaves will be affected first because they take up more of the herbicide-water solution and they are the primary photosynthetic tissue of the plant. Injured leaf tissue will eventually turn brown and die. Due to the chemical nature of the herbicide/soil relationship, injury symtpoms are likely to increase as the soil pH increase (higher than pH 7.2) (Figure _____)
			phenmedipham	component of Betamix	
		Triazine	atrazine	Aatrex, others	
			prometryn	Caparol	
			simazine	Princep	
		Triazinone	hexazinone	Velpar	
			metribuzin	Sencor, others	
		Uracil	terbacil	Sinbar	
6	Photosynthesis II Inhibitors	Benzothiadiazole	bentazon	Basagran	Plant injury is confined to foliage that has come in contact with the herbicde. Affected leaves will become yellow or bronze in color and eventurally turn brown and die. Injury symptoms can look similar to the injufry caused by cell membrane disrupters. Crop oil concentrate and other additives may increase weed control and crop injury symptoms (Figure _____)
		Nitrile	bromoxynil	Buctril, others	Plant injury is confined to foliage that has come in contact with the herbicide. Foligate that has been thoroughly covered with the herbicide will turn yellow, then turn brown and die. Contact of a low rate of herbicide with leaves may result in spotting and speckling of the leaf surface. Crop oil concentrates and other additives may intensify injury symptoms
7	Photosynthesis II Inhibitors	Amide	propanil	SuperWham	
		Urea	diuron	Direx, Karmex	
			fluometuron	Cotoran	
			linuron	Lorox, Linex	
Nitrogen Metabolism Inhibitor					
10	Glutamine Synthetase Inhibitor	Organophosphorus	glufosinate	Liberty	
Pigment Inhibitors					
13	Diterpene Biosynthesis	Isoxazolidnone	clomazone	Command	Plants turn white, often become translucent at the leaf tips (Figure _____)
27	HHPD Inhibitors	Isoxazole	isoxaflutole	Balance Flexx	
		Pyrazole	pyrasulfotole	component of Huskie	
		Pyrazolone	topremezone	Armezon, Impact	
		Triketone	mesotrione	Callisto	
			temotrione	Laudis	
Cell Membrane Disrupters					
14	PPO Inhibitors	Aryl triazinone	sulfentrazone	Spartan	On a bright and sunny day, injury symptoms can occur in 1 to 2 hours. Plant leaves will yellow and then turn brown an ddie. Reddish-colored spotting on the leaf surface may appear shortly after the herbicide is applied. Plants that do not die may be stunted for a week or more. Crop oils and other additives, as well as extremely cool or warm temperatures, may increase plant injury.
			carfentrazone	Aim	
			fluthiacet	Cadet	
		Diphenylether	acifluorfen	Ultra Blazer	
			fomesafen	Flexstar, Reflex, others	
			lactofen	Cobra, Pheonix	
		N-phenylphthalimide	flumiclorac	Resource	
			flumioxazin	Valor	
22	Photosystem I Electron Diverter	Bipyridylium	diquat	Reglone	On a bright and sunny day, injury symptoms can occur in 1 to 2 hours. Plant leaves will have a limp, water-soaked appearance, which is followed by browning (necrosis) of the plant tissue. Drift injury will appear
			paraquat	Gramoxone SL	
Seedling Root Growth Inhibitors					
3	Microtubule Inhibitors	Amide	pronamide	Kerb	General symptoms include stunted plants that do not fully emerge from the soil and short, thick lateral roots. Soybeans may have swollen and cracked hyposotyls (the area below the cotyledons). Following preemergence treatements, callus tissu may appear at the base of soybean stems (Figure _____)
		Dinitroaniline	ethaalfluralin	Sonalan	
			pendimethalin	Prowl H20, others	
			trifluralin	Treflan, others	
Seedling Shoot Growth Inhibitors					
8	Lipid Synthesis Inhibitor	Thiocarbamate	butylate	Sutan +	
			cycloate	Ro-Neet	
			EPTC	Eradicane, Eptam	
			thiobencarb	Bolero	
			triallate	Far-Go	
15	Long-chain Fatty Acid Inhibitors	Chloroacetamide	acetochlor	Degree, Harness, Surpass, Topnotch, Warrant, others	General symtpoms include stunting of shoots an dpoor emergence from the soil. Soybeans may have crinkled or puckered leaves or leaf buds may not open and/or a shortened mid-vein, which produces a "drawstring" effect (Figure _____)
			alachlor	Intrro, Micro-tech	
			s-methalchlor	Dual Magnum, others	
			dimethenamid-P	Outlook	
		Oxyacetamide	flufenacet	Define	
		Pyrazole	pyroxsaulfone	Zidua	
16	Specific Site Unknown	Benzofurane	ethofumesate	Nortron	
Undefined					
17	Nucleic Acid Inhibitor	Aresenical	MSMA	MSMA	