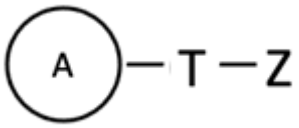
Claims (Marked):

1. An herbicidal composition comprising a compound or a salt thereof having the structure of



and at least one agriculturally acceptable carrier,

wherein:

A is a cyclopentadiene scaffold comprising from 1 to 2 heteroatoms; wherein each of the heteroatoms is independently selected from the group consisting of N, and S; and wherein one or more of the carbon, nitrogen, or sulfur atoms of the scaffold are chemically attached to at least one of $-CX_3$, $-CX_2R$, -COX, -CHO, -COR, $-CO_2R$, $-CONH_2$, -CONHR, =S, =O, -F, -Cl, -Br, and -I; and

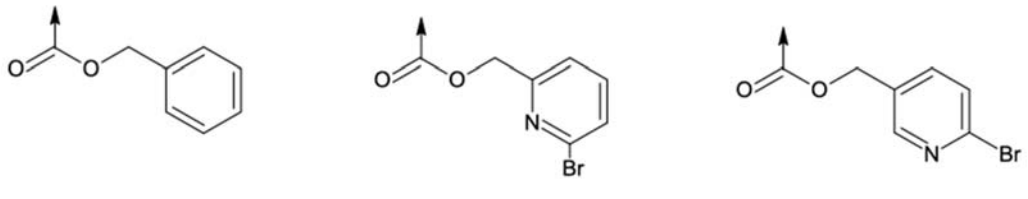
T is $-(CH_2)_n-$, $-OR_1-$, $-SR_1-$, $-SOR_1-$, $-CSR_1-$, -CS-, $-POHR_1-$, $-PO(OR_1)R_1-$, -CO-, or $-C(O)R_1-$;

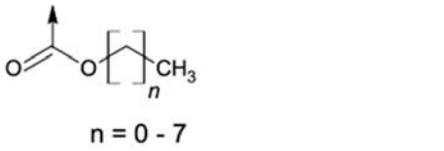
Z is H, substituted or non-substituted alkyl, substituted or non-substituted aryl group, -COOH, -COO-, -OH, -O-R, -COOR, $-O-(CH_2CH_2O)_nR$ ($n\geq1$); $-O-(CHMeCH_2O)_nR$ ($n\geq1$)), substituted or unsubstituted phosphate group, cyano group, carbamoyl group, primary amine, secondary amine, tertiary amine, carboxamide, –NR-O-R, –O-NR, or a salt thereof; and,

X is selected from F, Cl, Br and I

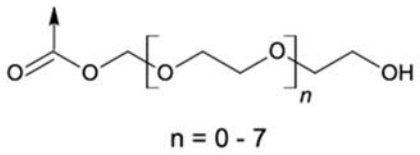
wherein R is a H, substituted or non-substituted alkyl, and substituted or non-substituted aryl group; and, wherein R_1 is $-(CH_2)_n-$ (n is 0 to 9).

2. The herbicidal composition of claim 1, wherein Z is selected from





n = 0 - 7



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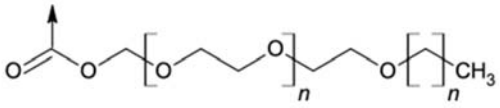
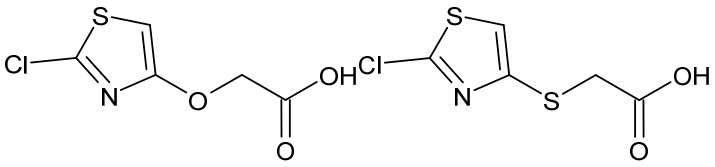
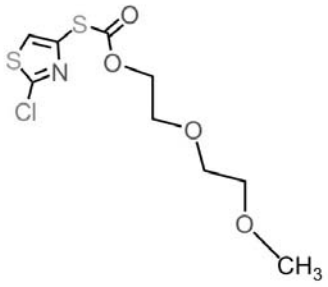
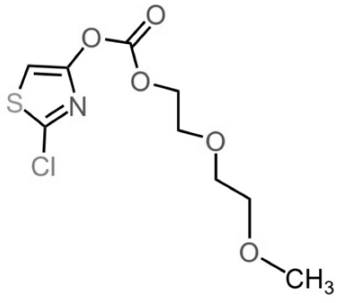


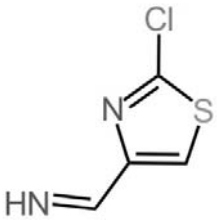
n = 0 - 7

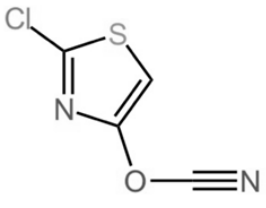
3. The herbicidal composition of claim 1, comprising the compound having the structure

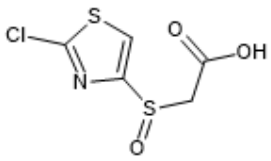
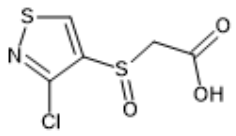
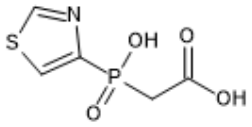
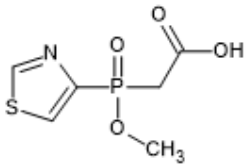
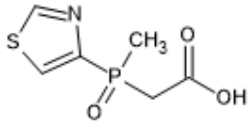








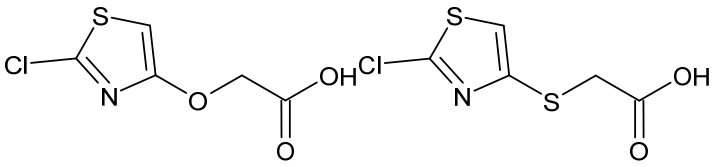
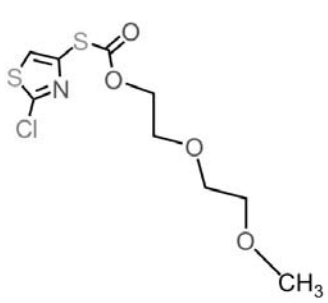
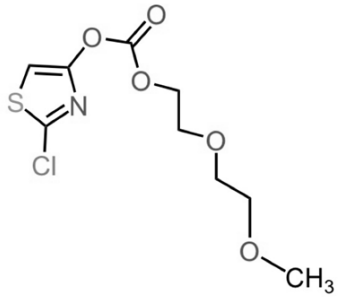
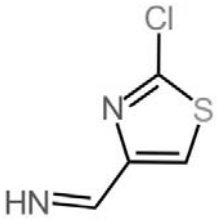
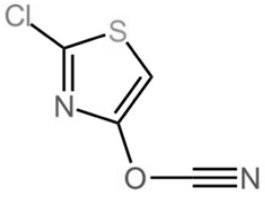
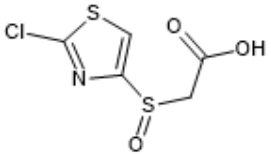
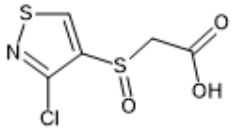
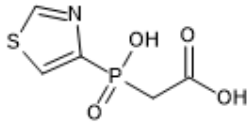
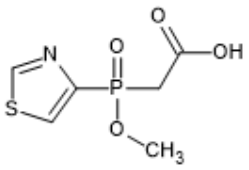
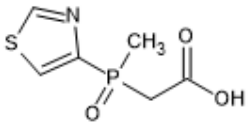


4. The herbicidal composition of claim 1, further comprising at least one crop protection agent.
5. The herbicidal composition of claim 4, wherein the at least one crop protection agent is selected from the group consisting of fungicide, insecticide, herbicide, and plant growth regulator.
6. The herbicidal composition of claim 5, wherein the at least one crop protection agent is selected from the group consisting of atrazine, terbuthylazine, (S)-metolachlor, metolachlor, terbutryn, simazine, dimethenamid, (S)-dimethenamid, flufenacet, acetochlor, alachlor, isoxaflutole, isoxachlortole, mesotrione, sulcotrione, metosulam, flumetsulam, pendimethalin, bromoxynil, bentazone, carfentrazone-ethyl, clomazone, nicosulfuron, rimsulfuron, halosulfuron-methyl, metribuzin, flumiclorac-pentyl, prosulfuron, primisulfuron-methyl, dicamba, fluthiacet-methyl, pyridate, 2,4-D, clopyralide, diflufenzopyr, fluroxypyr, MCPA, MCPB, mecoprop (MCPP), metobenzuron, thifensulfuron-methyl, aclonifen, EPTC, glyphosate, glufosinate, sulfosate, cyanazine, propaquizafop, metamitron, pyramin, phenmedipham, desmedipham, ethofumesate, triasulfuron, chloridazon, lenacil, triallate, fluazifop, sethoxydim, quizalofop, clopyralide, clethodim, oxasulfuron, acifluorfen,

benazolin-ethyl, sulfentrazone, chlorimuron-ethyl, cloransulam-methyl, fomesafen, imazamox, imazaquin, imazethapyr, imazapyr, lactofen, fenoxaprop(P-ethyl), thidiazuron, tribufos, trifluralin, dimethachlor, napropamide, quinmerac, metazachlor, carbetamide, dimefuron, propyzamide, ethametsulfuron-methyl, tebutam, fluometuron, prometryn, norflurazon, pyrithiobac-sodium, MSMA, DSMA, diuron, flurochloridone, dithiopyr, thiazopyr, oxyfluorfen, ethalfluralin, clodinafop, amidosulfuron, diclofop-methyl, diflufenican, ethoxysulfuron, fentrazamide, flazasulfuron, florasulam, fluazolate, flucarbazone, flupyrsulfuron-methyl sodium, flurtamone, iodosulfuron, isoproturon, chlortoluron, chlorsulfuron, metsulfuron-methyl, sulfosulfuron, tribenuron-methyl, 2,4-DB, 2,4-DP, bifenox, flamprop-M, imazamethabenz-methyl, ioxynil, tralkoxydim, fluoroglycofen-ethyl, methabenzthiazuron, isoxaben, prosulfocarb, difenzoquat-metilsulfate, pretilachlor, cinosulfuron, fenclorim, bensulfuron-methyl, imazosulfuron, pyrazosulfuron-ethyl, azimsulfuron, esprocarb, mefenacet, molinate, propanil, pyrazolate, cyhalofop-butyl, bispyribac-sodium, pyriminobac-methyl, cafenstrole, oxadiargyl, oxadiazon, bromobutide, MY-100, dymron, NB 061, MK243, HW-52, AC 014, ametryn, hexazinone, asulam, azafenidin, tebuthiuron, ethametsulfuron-methyl, or a combination thereof.

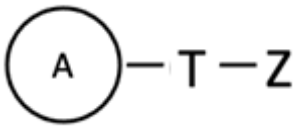
7. A compound having the structure selected from

or a salt thereof.

8. A method of controlling undesired plant growth comprising applying to the locus of said undesired plant growth the herbicidal composition of claim 1.

9. A method of controlling undesired plant growth, comprising applying to the locus of the undesired plant growth a herbicidally effective amount of a compound having the structure



or a salt thereof, wherein:

A is a cyclopentadiene scaffold comprising from 1 to 2 heteroatoms; wherein each of the heteroatoms is independently selected from the group consisting of N, and S; and wherein one or more of the carbon, nitrogen, or sulfur atoms of the ring are chemically attached to at least one of $-CX_3$, $-CX_2R$, -COX, -CHO, -COR, $-CO_2R$, $-CONH_2$, -CONHR, $-CON(R)_2$, sulfur =S, oxygen =O, -F, -Cl, -Br, and -I;

T is $-(CH_2)_n-$, $-OR_1-$, $-SR_1-$, $-SOR_1-$, $-CSR_1-$, -CS-, $-POHR_1$, $-PO(OR_1)R_1-$, -CO-, or $-COR_1-$;

Z is H, substituted or non-substituted alkyl, substituted or non-substituted aryl group, -COOH, -COO-, -OH, -O-R, -COOR, $-O-(CH_2CH_2O)_nR$ ($n\geq1$); $-O-(CHMeCH_2O)_nR$ ($n\geq1$)), substituted or unsubstituted phosphate group, sulfonyl group, $-SO_3H$, sulfo group, sulfonic/sulphonic acid, carbamoyl group, primary amine, secondary amine, tertiary amine, carboxamide, cyano group, –NR-O-R, –O-NR, or a salt thereof;

X is selected from F, Cl, Br and I; and,

wherein R is a H, substituted or non-substituted alkyl, and substituted or non-substituted aryl group; and, wherein R_1 is $-(CH_2)_n-$ (n is 0 to 9).

10. The method of claim 9, further comprising applying to the locus of the undesired plant growth at least one crop protection agent.

11. The method of claim 10, wherein the at least one crop protection agent is selected from the group consisting of

herbicides, fungicides, insecticides and plant growth regulators.

12. The method of claim 11, wherein the at least one crop protection agent is amino acid synthesis inhibitor herbicide.
13. The method of claim 12, wherein the amino acid synthesis inhibitor herbicide is selected from the group consisting of imazamox, imazapic, imazethapyr, imazaquin, imazapyr, imazamethabenz, Chlorimuron, Primisulfuron, Thifensulfuron, Triasulfuron, Nicosulfuron, Metsulfuron, Tribenuron, Rimsulfuron, Triflusulfuron, Glyphosate, and any combination thereof.
14. The method of claim 11, wherein the plant growth regulator is selected from the group consisting of dicamba, 2,4-D, clopyralid and fluroxypyr.
15. The method of claim 9, further comprising applying a third herbicide or a plant growth regulator.
16. The method of claim 9, wherein the locus of the undesired vegetation is field of a crop.
17. The method of claim 16, wherein the crop is selected from the group consisting of maize, wheat, rice, barley, sorghum, and oats.
18. The method of claim 9, wherein the compound is applied pre-emergence or post-emergence.
19. A method of selectively controlling growth of harmful weeds, comprising applying to a field of a crop an effective amount of the herbicidal composition of claim 1.
20. The method of claim 19, wherein the herbicidal composition is applied pre-emergence or post-emergence.
21. The method of claim 19, wherein the crop is selected from the group consisting of maize, wheat, rice, barley, sorghum, and oats.