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Common Herbicides and their Application Rates in Conservation Agriculture (CA) Systems

Recommended application rates for herbicides used in cereal crops

Herbicide	*Recommended rate (l/ha)*	*Weed species controlled*	*Notes*
Round Up (*Glyphosate*)	• Sand soil: 1.5-2.5 • Clay soil: 2.5-5.0	Couch grass, Wandering jew, Ricardia scabra, Striga, Sedges, Rapoko grass	Application rate will depend on weed species and height
Atrazine (*Aatrex*)	• Sand soil: 3.6 • Clay soil: 4.5-5.5	Wandering jew, Mexican clover, Sedges, Witch weed, Black jack, some grasses	Use higher rates when weeds have emerged. Minimize runoff in fields treated with Atrazine
Paraquat (*Gramoxone*)	• Sand soil: 1.0-2.0 • Clay soil: 1.0-3.0	Rapoko grass, Shamva grass, Couch grass, some broadleaves	Application rate will depend on weed height. Avoid contact with crop
Dual *(Metolachlor)*	• Sand soil: 1.0 • Clay soil: 1.0-1.2	Couch grass, Rapoko grass, Shamva grass, Sedges, some broadleaves	Use higher rates for control of sedges
Basagran *(Bentazon)*	• Sand soil: 3.0 • Clay soil: 3.0-5.0	Wandering jew, Mexican clover, Sedges, Witch weed	Application rate will depend on weed plant height
Accent *(Nicosulfuron)*	Sand and clay soils: 46 grams/ha + a wetter, apply in 200-300 L water/ha	Shamva grass, Rapoko grass, Couch grass	Ensure good agitation of the mixture during application
Harness (*Acetochlor*)	• Sand soil: 0.5-1.0 • Clay soil: 1.0	Rapoko grass, Shamva grass, Couch grass, some broadleaves	Normally used with broadleaf herbicide. Apply higher rates when used alone.
Bullet (*Alachlor*)	• Sand soil:2.5-3.5 • Clay soil:3.0-4.0	Rapoko grass, Shamva grass, Couch grass, some broadleaves	Apply immediately after planting.

How does each herbicide work?

Glyphosate

- Non-selective and systemic herbicide which kills actively growing weeds.
- Apply glyphosate 3-4 days before or after sowing but before the crop emerges. The effect of glyphosate on weed plants begins to be seen 7-14 days after application.
- Ensure a 6-8 hour rain free period after glyphosate application to get maximum weed control.

Atrazine

- Selective and contact herbicide which can be applied to the soil or on weed foliage.
- Atrazine is activated by moisture on weed plant foliage or on the soil surface. Effect of Atrazine on weed plants can be seen 4-5 days after application.
- Atrazine gives good results if at least 20 mm of rain falls a few days after application and is not recommended in areas that receive annual rainfall of less than 400 mm.
- Residual effect of Atrazine on broadleaved annual weeds can last three months after application.

Dual

- Selective herbicide which is applied on the soil surface.
- Adequate soil moisture in the soil layer of weed seed germination activates the herbicide.
- Dual requires a rain free period of up to 1 hour after application.

Paraquat

- Selective and contact herbicide, which should be applied to young actively growing weeds.
- Paraquat acts very fast and its effect on weed plant foliage can be seen after a few minutes of application.
- Paraquat requires 30 minutes to 1 hour rain free period after application.

Basagran

- Selective and contact herbicide applied to actively growing weed plants at 2-4 leaf stage.
- Effect of Basagran on weed plants is seen 2 days after application and a second application can be done 10-14 days after the first spray if weed control has not been achieved with the first application.
- Ensure 8 hour rain free period after application to achieve best results.

Accent

- Selective and systemic herbicide applied to actively growing weed plants and can be applied from 3-5 leaf to flowering growth stages of the maize crop.
- Accent should not be sprayed over maize funnels after 3-5 leaf stage.
- Effect on weed plants is seen 12-14 days after application and requires 4-6 hour rain free period.

Recommended application rates for herbicides used in legumes and other crops

Herbicide	*Recommended rate (l/ha)*	*Weed species controlled*	*Notes*
Round Up *(Glyphosate)*	• Sand soil: 1.5-2.5 • Clay soil: 2.5-5.0	Couch grass, Wandering jew, Ricardia scabra, Striga, Sedges, Rapoko grass	Application rate will depend on weed species and height
Paraquat *(Gramoxone)*	• Sand soil: 1.0-2.0 • Clay soil: 1.0-3.0	Rapoko grass, Shamva grass, Couch grass, some broadleaves	Application rate will depend on weed height. Avoid contact with crop
Dual *(Metolachlor)*	• Sand soil: 1.0 • Clay soil: 1.0-1.2	Couch grass, Rapoko grass, Shamva grass, Sedges, some broadleaves	Use higher rates for sedges
Basagran *(Bentazon)*	• Sand soil: 3.0 • Clay soil: 3.0-5.0	Wandering jew, Mexican clover, Sedges, Witch weed	Application rate will depend on weed plant height
Agil *(Propaquizafop)*	• Sand soil: 0.5-1.5 • Clay soil: 2.0-3.0	Couch grass, Rapoko grass, Shamva grass	Ensure thorough agitation during mixing and spraying

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This technical bulletin was prepared by Walter Mupangwa and Christian Thierfelder as part of CIMMYT's BMZ and IFAD-funded projects on „Facilitating the Widespread Adoption of Conservation Agriculture in Eastern and Southern Africa". Contacts: c.thierfelder@cgiar.org

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For more information please contact:
CIMMYT, Southern Africa Regional Office
P.O. Box MP 163
Mt. Pleasant, Harare, Zimbabwe
Tel +263 772815230
www.cimmyt.org