

## Directions for Management of Perennial Broad-Leaved Weeds in Lowland Rice

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Some of the most frequently encountered perennial broad-leaved species of rice in rain-fed and irrigated lowlands include: *Chromolaena odorata*, *Alternanthera sessilis*, *Commelina benghalensis*, *Commelina diffusa*, *Ipomoea aquatica*, *Ipomoea asarifolia* (syn. *Ipomoea repens*), *Ipomoea cairica*, *Aeschynomene indica*, *Alysicarpus rugosus*, *Mimosa pigra*, *Mimosa pudica*, *Zornia latifolia*, *Senna alata*, *Sida acuta*, *Sida cordifolia*, *Sida rhombifolia*, *Urena lobata*, *Waltheria indica*, *Thalia geniculata*, *Marsilea crenata*, *Marsilea diffusa*, *Heterotis rotundifolia* (syn. *Dissotis rotundifolia*), *Ludwigia adscendens* (syn. *Jussiaea repens* (syn. *Ludwigia stolonifera*), *Oxalis latifolia*, *Passiflora foetida*, *Spermacoce latifolia* (syn. *Borreria latifolia*), *Lindernia crustacea*, *Lindernia nummulariifolia*, *Solanum torvum*, *Typha domingensis*, *Trema micrantha*.

Perennial weeds can live for more than two years and use vegetative underground (and sometimes aboveground) structures such as stolons (or runners), bulbs or woody stocks for their survival and propagation (Zimdahl, 2007). Stolons are vegetative organs that creep just above or at the soil level, that can root and form new stems at the nodes. Examples of broad-leaved species with stolons are: *Commelina benghalensis*, *Commelina diffusa* and *Ipomoea aquatica*. Besides vegetative reproduction and survival strategies, perennial weeds also propagate through the production of seeds. Any management practice, in order to provide effective control of perennial weeds, should focus on prevention of seed production (like with annual weeds) and removal or killing of the vegetative underground structures. This can be done mechanically by deep tillage in the off-season, trying to bring all stem, root and other propagation structures to the soil surface to be collected and removed (and burned) or killed by exposure to the sun (drying out) or by using herbicides (Rodenburg and Johnson, 2009). One of the most difficult perennial broad-leaved weed is *Chromolaena odorata*. Rootstocks can be killed by tillage and regrowth should be cut or weeded by hand or treated by spot-application of herbicides like glyphosate or mixtures of 2,4-D and triclopyr (Johnson, 1997). Similar approaches can be used against other perennial broad-leaved weed species. Effective herbicides against perennial broad-leaved weeds are listed in Table 1.

Table 1 Suitable herbicides for broad-leaved weed species in rain-fed and irrigated lowland rice

Common name	Example of product	Rates (kg a.i. ha <sup>-1</sup> )	Timing
• 2,4-D	• Dacamine	0.5-	Late post
	• Fernoxone	1.5	
	• Herbazol		
• 2,4-D +			
○ dichlorprop	Weedone	1-1.5 (l ha <sup>-1</sup> )	Post
• bensulfuron	Londax	0.05-1.0	Post

• bentazon	Basagran	1.0-3.0	Post
• bifenox	As a mixture= Foxpro D	1.5-2.4	Pre
• butachlor*	Machete	1.0-2.5	Pre/early post
• dymrone (K-223)	Dymrone	3.0-5.0	Pre
• fluorodifen	Preforan	2.0-3.5	Pre
• MCPA	Herbit	0.5-1.5	Post
• molinate	Ordram	1.5-4.0	Pre/early post
• oxadiazon**	<ul style="list-style-type: none"> <li>• Ronstar 25EC</li> <li>• Ronstar 12L</li> </ul>	0.6-1.5	Pre/early post
• Pendimethalin***	<ul style="list-style-type: none"> <li>• Stomp 500</li> <li>• Prowl</li> </ul>	0.5-1.5	Pre
• pretilhachlor + ○ dimethametryne	Rifit extra 500 EC	1.5/0.5	Pre
• propanil +			
○ bentazon	Basagran PL2	6-8 (l ha <sup>-1</sup> )	Post
○ triclopyr	Garil	5 (l ha <sup>-1</sup> )	Post
○ oxadiazon	Ronstar PL	5 (l ha <sup>-1</sup> )	Post
• thiobencarb****	Saturn	1.5-3.0	Pre/early post

\* Known exception is *Commelina benghalensis*

\*\* Exceptions are *Commelina benghalensis* and *Chromolaena odorata*

\*\*\* Exception is *Commelina benghalensis*

\*\*\*\* Exception is *Commelina benghalensis*

## References

- Johnson, D.E., 1997. *Weeds of rice in West Africa*, WARDA, Bouaké.
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- Zimdahl, R.L., 2007. *Fundamentals of weed science*, Academic Press, London.