

Directions for Management of Perennial Grasses in Lowland Rice

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Some of the most frequently encountered perennial grasses of rice in rain-fed and irrigated lowlands include: *Acroceras zizanioides*, *Axonopus compressus*, *Cynodon dactylon*, *Diplachne fusca*, *Echinochloa pyramidalis*, *Echinochloa stagnina*, *Eragrostis tenuifolia*, *Imperata cylindrica*, *Leersia hexandra*, *Panicum maximum* (syn. *Megathyrsus maximus*), *Oryza longistaminata*, *Panicum repens*, *Paspalum distichum* (syn. *Paspalum paspalodes*), *Paspalum scrobiculatum*, *Paspalum vaginatum*, *Sacciolepis africana*, *Sacciolepis striata*, *Setaria geminata*, *Vetiveria zizanioides*, (syn. *Chrysopogon zizanioides*) and *Vossia cuspidata*.

Perennial weeds can live for more than two years and use vegetative underground structures such as rhizomes and stolons (or runners) for their survival and propagation. Rhizomatous weeds develop underground stems that propagate and produce new plants. Examples of rhizomatous grasses are: *Oryza longistaminata*, *Paspalum distichum* and *Cynodon dactylon*. 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 grasses with stolons are: *Axonopus compressus*, *Cynodon dactylon* (both rhizomes and stolons), *Panicum repens* (occasionally) and *Paspalum vaginatum*.

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. Land preparation combined with pre-emergence herbicide, in particular glyphosate, can improve control of many perennial grasses. Frequent tillage can also be partly effective on the short term as it will cut up rhizomes, encourage re-sprouting of buds and thereby depleting the weed's food reserves (Ampong-Nyarko and De Datta, 1991). Some perennial species that are particularly difficult to control, such as *P. distichum*, could be (partially) suppressed by out-shading obtained by higher plant densities and more vigorous or competitive rice varieties (e.g. Rodenburg et al., 2009, Saito et al., 2010, Haefele et al., 2004). Pre-emergence herbicides such as glyphosate or a mixture of glufosinate and imazapyr are effective in particular when applied on plants with mature leaves (Ampong-Nyarko and De Datta, 1991). For more herbicides see Table 1 below.

Table 1 Suitable herbicides for grasses in rain-fed and irrigated lowland rice

| Common name | Example of product | Rates (kg a.i. ha ⁻¹) | Timing |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------|----------------|
| • 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 |
| • glyphosate | Round-up | 1.5-3.0 | Pre/post |
| • molinate | Ordram | 1.5-4.0 | Pre/early post |
| • oxadiazon | <ul style="list-style-type: none"> • Ronstar 25EC • Ronstar 12L | 0.6-1.5 | Pre/early post |
| • pendimethalin* | <ul style="list-style-type: none"> • Stomp 500 • Prowl | 0.5-1.5 | Pre |
| • piperophos | Rilof 500 | 0.5-2.0 | Pre/early post |
| • pretilhachlor + ○ dimethametryne | Rifit extra 500 EC | 1.5/0.5 | Pre |
| • propanil | <ul style="list-style-type: none"> • Stam F34 • Propanil • Surcopur • Rogue | 2.5-4.0 | Early post |
| • quinclorac | Facet | 0.25-0.5 | Pre/post |
| • thiobencarb | Saturn | 1.5-3.0 | Pre/early post |

* Exceptions is *Leersia hexandra*

References

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