

Herbicides

Herbicides should be used in combination with other methods of weed control such as cultural (i.e., use of crop residues as mulches, [stale seedbed technique](#)), and [manual and mechanical weeding](#).

When to apply

For effective weed control, different herbicides should be applied at different growth stages.


- **Pre-planting**

Spray non-selective herbicides on existing vegetation to kill weeds before planting.

Examples of herbicides to use: glyphosate, paraquat*, glufosinate

Read: [Using zero tillage for weed control during land preparation](#)

*Banned in some countries; check herbicide availability and regulations



- **Pre-emergence**

Apply herbicides prior to weed emergence at 1–3 DAS/DAT.

Examples of herbicides to use:

- for transplanted rice - butachlor, pretilachlor
- for wet seeded rice - pretilachlor + fenclorim
- for dry seeded rice - oxadiazon, pendimethalin, oxadiargyl

- **Post-emergence**

Spray herbicides at 3–4 leaf stage of the weed.

Examples of herbicides to use: bisparybachispyribac, fenoxaprop + safener, fenoxaprop + ethoxysulfuron, metsulfuron + chlorimuron, azimsulfurom, penoxsulam, penoxsulam + cyhalofop, bentazon, 2,4-D

Read: [Knockdown and post-emergence herbicide in DSR](#) (pdf) from [Direct Seeded Rice \(DSR\) in the Eastern Gangetic Plains of India](#)

How to apply

1. Always read and follow the instructions on the product label.
2. Choose products suited for the type of weeds to be controlled and stage of crop or weed growth to which they should be applied.
3. Ensure that field conditions are suitable for herbicide activity (e.g. soil must be moist, saturated or with standing water).
4. Use the recommended rate and dilution.
5. Use clean water for spraying.
6. Calibrate sprayer and make sure spray nozzles are functioning properly. Use flat-fan nozzle for better delivery and surface cover.
7. Uniformly apply product in the field by maintaining proper pressure, walking speed, and sufficient swath overlap.
8. When post-emergence herbicides are applied in moist or saturated soil, re-introduce water into the plots one day after application, and maintain desired water depth.

- Always mix clean water with herbicides before application. Refrain from using muddy water as this reduces herbicide efficacy.
- Ensure all equipment, such as spray tanks, booms, and nozzles are well-cleaned after every use.
- Do not mix herbicides together unless recommended.
- Apply herbicides at a recommended rate.
- Remember to wear proper protective equipment (i.e., gloves, breathing mask, goggles, and protective clothing) when spraying.

Read: [Pesticide safety and knapsack sprayer use](#) (pdf)
