7. Weed control in intercrops

A weed is any plant that grows where it is not wanted and competes with cultivated crops for nutrients, moisture and light. Weeds are thus undesirable in any cropping system as they cause yield reduction through competition for the same resources needed by the cultivated crop and often interfere with crop harvesting. Weeds also provide a shelter for pests and diseases that can attack the cultivated crop leading to a reduction in crop yields and crop quality. The yield reduction from weeds can be a very serious problem in smallholder farming systems (Figure 61).


Figure 7.1 maize crops heavily infested with weeds

Studies conducted in Malawi in 2018 showed that returns to one weeding run were equivalent to 1000 kg/ha of maize in systems in which farmers weeded up to 3 times per season, meaning that each weeding enabled a farmer to harvest 1 extra tonne of maize. Elsewhere studies have suggested that the benefit of one weeding can be equivalent to 1 bag of top-dressing fertilizer. In maize, the most serious yield reduction due to weeds happens in the first 6 weeks of crop establishment.

When should weeds be controlled?

Effective weed control starts all the way from the time of land preparation until harvest. Farmers should strive to prevent weeds from growing to the point of seeding as this helps to reduce the seed bank in subsequent seasons. Some weed seeds are thought to remain dormant for up to 20 years. Therefore to control weeds effectively the farmer needs to keep reducing the seed numbers that are dormant in the seed bank. Weeds are also the biggest challenge especially in the initial years of practicing CA. It takes about 3-5 years for the number of weeds in the soil to be reduced so that very few weeds grow. CA improves soil fertility; hence weeds are encouraged to grow as well. Couch grass and yellow nutsedge are the most difficult weeds to control because they are difficult to uproot.

Weeds are best controlled during the following times:

(a) Soon after harvesting to prevent seed multiplication during the dry or off crop season.
(b) After the rains but before harvest is important to manage winter weeds, minimize moisture loss and make harvesting easier.
(c) During the cropping season weeds should also be controlled before or at planting e.g. through land preparation.
(d) Weeds should be controlled before flowering.

How to control weeds

The intercrops increase the plant density and have a shading effect on emerging weeds. So generally less or fewer weeds emerge in intercrops compared to sole cropping. Weed pressure is also generally higher under the following conditions.

a. High soil moisture conditions: This may arise from excessive rains or residual moisture as the season tails off. The use of crop residues under CA also helps to increase moisture, and may also result in more weeds although residues are generally known to suppress weeds

b. High fertility conditions. Fertile soils also create conducive conditions for weed growth. So it is important to ensure the improved fertility is not taken up by the weeds through effective weed control methods.

Apart from mechanical methods of weed control, chemical weed control methods using herbicides (Table 6.1) are available in most countries but farmers should be careful when using these as they can kill the crop or may poison the user if recommendations are not properly followed. It is thus important for farmers to read the label on the chemical. Some herbicides such as glyphosate can kill everything that is green (non-selective), while others (selective) may kill broad leaved plants or grasses only (Tables 7.1 and 7.2).

The most widely used herbicide applied before planting is glyphosate. Glyphosate needs at least 4 hours free of rain after application and may be applied at the rate of 2-3 litres per ha. Further details on herbicides should be sought from local extension staff for farmers planning to use herbicides to help reduce labour pressure for weed control.

Table 7.1 Some recommended application rates for herbicides used in cereal crops

Herbicide	**Recommended rate (l/ha)**	**Weed species controlled**	**Notes**
Round Up (Glyphosate)	• Sandy soil: 1.5-2.5 • Clay soil: 2.5-5.0	Couch grass , Wandering jew, *Ricardia scabra*, Striga, Sedges, Rapoko grass (*Eleusine corocana*)	Application rate will depend on weed species and height
Atrazine (Aat rex)	• Sandy 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)	• Sandy 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)	• Sandy 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)	• Sandy 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)	• Sandy 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)	• Sandy soil: 2.5-3.5 • Clay soil: 3.0-4.0	Rapoko grass, Shamva grass, Couch grass, some broadleaves	Apply immediately after planting

Table 7.2 Some recommended application rates for herbicides used in legumes and other crops

Herbicide	**Recommended rate (l/ha)**	**Weed species controlled**	**Notes**
Round Up (Glyphosate)	• Sandy 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)	• Sandy 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)	• Sandy 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)	• Sandy 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)	• Sandy soil: 0.5-1.5 • Clay soil: 2.0-3.0	Rapoko grass, Shamva grass, Couch grass	Ensure thorough agitation during mixing and spraying