

WEED MANAGEMENT IN COFFEE



DEFINITION

A weed is a plant, which grows where its is not wanted.

Types of weeds

Weeds in coffee can be grouped into;

- **Annual weeds:** These are easy to control e.g love grass and black jack.



Black jack (annual weed)

- **Perennial weeds:** persist over seasons and so are difficult to control
e.g, couch grass and *Commelina spp.*



Kikuyu grass (Perennial weed)

Weed Management

Cultural weed management include:

- Mulching
- High density coffee planting
- Shade trees
- Cover crops

Mechanical weed management practises

- (a) Forked hoe (jembe). Apart from removing the weeds, a forked hoe leaves a rough soil surface which helps reduce soil erosion. Forked jembe does not seriously damage coffee roots.
- (b) Tractor mounted rotary or tined cultivator used in large coffee estates where the use of the 'jembe' would require a large labour force.

Table 1: Some common weeds found in coffee growing areas

Common Names	Local Names	Botanical Names	Growth habit	Reproduction	Comments
Black Jack	Mucege, Kichoma, Muguu, Munzee, Onyiego	<i>Bidens Pilosa</i> L.	Annual broad leaved weed	Exclusively by seeds	Does not pose major problems both culturally and chemically
Pigweed	Terere, Omboga	<i>Amaranthus sp</i>	"	"	"
Gallant Soldier	Kang'ei, Msekeseke, Mungei,	<i>Galinsoga parviflora</i>	"	"	"
Mexican marigold	Muvangi, Bahngi, Mubangi	<i>Tagetes minuta</i>	"	"	"
Black Night shade	Managu, Inagu, Osuga	<i>Solanum nigrum</i>	"	"	"
Mexican Mari gold	Mubangi, Bhangi, Muvangi	<i>Targetes minuta</i>	"	"	"
Parthenium	*	<i>Parthenium hysterophorus</i> L.	"	"	Resistant to Paraquat
Wood sorrel	Ndabibi	<i>Oxalis sp</i>	Annual and perennial Broadleaf	Bulbs	Difficult to control by cultivation or chemically
Wandering Jew	Mukengeria, Djadja, Odiedo	<i>Commelina sp</i>	Annual & Perennial	Seeds and Stem	Physical removal recommended
Purslane	Gatumia	<i>Portulaca oleracea</i>	Annual succulent	Seeds, stem	"
Nut/ Watergrass	Ndago, Kikatu	<i>Cyperus sp</i>	Perennial herbs (sedges)	Nuts or bulbs	Difficult to control by cultivation. Mulching assists

False/water grass	*	<i>Chlorispycnothrix</i>	Annual grass	Exclusively by seeds	Easily controlled
Wild Finger-millet	Malulu, Bek	<i>Eleusine indica</i> and <i>E. Africana</i>	"	"	"
Love grass	Maramata, Kiamata	<i>Setaria verticillata</i>	"	"	"
Crows foot grass	*	<i>Dactylactanium aegyptium</i>	"	"	"

Table 1 contd

Kikuyu grass	Witima, Watima, Olobobo	<i>Pennisetum cladestinu</i>	Perennial grass	Stolons, Rhyzomes	Difficult to control by cultivation. Controlled by systemic herbicides
Star Grass	Igoka, Emuruwa, Iogowi, Modhno, Lukhafwa	<i>Cynodon dactylon</i>	Perennial grasses	"	Difficult to control by cultivation
Couch grass	Sangari, Siratet,, Thangari	<i>Digitaria scalarum</i>	"	Seeds, stolons and rhizomes	Controlled by systemic herbicides

*Local names not available

Table 2: Recommended Foliage– Applied herbicides using ICI Polijet /Flood Jet Nozzles

Common Names/ Trade Name	Chemical Names	Formulation	Application rate in kg or l/ha	gm or ml/20 l container
Paraquat (Gramoxone)	1, 1-dimethyl 4,4, Bipyridylum Dichloride'	20% ml	2.0 l	160 ml
Glyphosate (Roundup)	N-phosphonomethyl glycine	36% ml	3 - 4 l	240 - 329 ml
Sulfosate (Touch down)	N-phosphonomethyl glycine	48% ml	2 - 3 l	160 - 240 ml
Fusilade (selective grass killer)	Butyl-2 (5-tri-fluoro-methyl-2 pyridyloxy-phenyl) propionate	25% ml	3 or 4 l**	240-320 ml

Table 2 cont'.....

Fusilade (selective grass killer)	Butyl-2(5-tri-fluoro-methyl-2-pyridyloxy-phenyl) propionate	25% ML	3 or 4 l**	240-320 ml
Glufosinate-ammonium (Basta 20EC)	Ammonium DL-homoammonium alamin-4-yl (methyl)(Basta 20EC) phosphinate	20 EC	2 - 3 l	160 - 240 ml
Basta 14 SL	"	14 SL	2 l	160 ml
Glyphosate (Kamata)	Iso propylamine salt of N-phosphonomethyl glycine	9% l	3 - 6 l	240 - 480 ml
Glyphosate (Sting)	Iso propylamine salt of N-phosphonomethyl glycine	18% l	1.5 - 3 l	120 - 240 ml
Haloxyfop etho-xyethyl (Gallant selective grass killer)	Ethoxyethyl 2-(4-(3-chloro-5125 E)-(trifluo-remethyl)-2-2 pyridinyl oxy) phenoxy propanoate	12.5% l	3 - 4 l	240 - 320 ml
Paraquat (Novaquat)	1, 1-dimethyl-4,4 Bipyridinium Dichloride	25% l	2 l	160 ml
Glyphosate	N-(phosphonomethyl) glycine	12% l	3 - 4 l	240 - 320 ml
Glyphosate (wipeout)***	N-(phosphonomethyl) glycine	48% l	3 l	240 ml
Glyphosate (Glypos)		36% l	3 l	240 ml
Glyphosate (mamba)		36% l	3 l	240 ml

Table 3: Recommended Foliage—applied herbicides on annual weeds* using Low volume flood jet nozzles**

Common Names	Chemical Names	Formulation	Application Rate in kg or l/ha	g or ml/20l Container
Glyphosate (Round-up)	N-phosphonomethyl glycine	36% ml	0.5-1.0 l	100 - 200 ml
Glyphosate (Sting)	"	18% ml	1 - 1.5 l	200 - 300 ml
Glyphosate (Kamata)	"	9% ml	2 l	400 ml
Sulfosate (Touch down)	"	48% ml	0.5 - 1.0 l	100 - 200 ml
Glufosinate-ammonium (Basta 20EC)	Ammonium DL-homoammonium alamin-4-yl(methyl) phosphinate	20 EC	1.0 - 1.5 l	200 - 300 ml
Basta 14SL	"	14 SL	1.5 l	300 ml
Paraquat (Gramoxone)	1, 1-dimethyl 4,4,1-(Gramoxone) bipyridylium Dichloride	20% ml	1.0 - 1.5 l	200 - 300 ml
Roundup dry (42 SG)	N-Phosphonomethyl Glycine	42% SG	1 kg	200 g (2 sachets)
Glyphosate (wipeout)	N-phosphonomethyl glycine	36% ml	1.0-1.5 l	200-300 ml
Glyphosate (Glypos)	N-phosphonomethyl glycine	48% ml	1.0-1.5 l	200-300 ml
Glyphosate (mamba)	N-phosphonomethyl glycine	36% ml	1.0-1.5 l	200-300 ml
Glyphosate (Glyphogan)	N-phosphonomethyl glycine	48%SL	2-3 l	200-300 ml

Table 4: Recommended soil applied herbicides

Common Names	Chemical Names	Formulation	Application Rate Kg or lt/ha	gm or ml per 20 l container (average knapsack sprayer)
1. Atrazine	2-Chloro 4-ethylamino 6-isopropyl amino-1, 3, 5-triazine	50%WP 80%wp	6.0 kg 3.75 kg	300.00 g 187.50 g
2. Diuron	3-(3,4-dichlorophenyl)-1,1 dimethylurea	80%WP	3.75 kg 1.25 kg	168.75 g 62.5 g
3. Simazine	2-Chloro-4, 6-bis (ethylamino)-1,3,5 - triazine	50%WP 80%WP	5.00 kg 3.125 kg	250.00 g 156.25 g
4. Candex	Methyl-4-aminobenzene sulphonyl Carbonate + 2-chloro-4-ethylamino-6-isopropyl amino-1,3,5-triazine	65% ml	6.5 l	352 ml
5. Goal 2E	2-Chloro-1-(3-ethoxy-4-nitrophenoxy-4-trifluoromethyl benzene	24% ml	3 or 6 l**	150 or 300 ml
Flazasulfuran**	Sulfonylurea	25%	0.4 kg	20 gm

(c) Weed Slashing

- When soils are too wet, the use of 'jembe' or rotary cultivator would not achieve good results
- Weed slashing would minimise water and nutrient uptake by weeds.
- Avoid injury to the stem as this could create an avenue for fusarium infection.

Chemical

This is the use of chemicals to manage weeds (refer to Table 2,3,4). Chemicals used to manage weeds are referred to as herbicides.

Commonly used herbicides for weed control

(a) Foliar applied herbicides

- Contact herbicide kills on contact e.g paraquat like gramoxone
- Systemic herbicide kills by translocation of the herbicides e.g glyphosates like Roundup and touch down
- Glyphosates are mainly recommended for the difficult to control perennial grasses but can be used as broad spectrum herbicides
- Target annual weeds in their 1st to 4th leaf stage

For foliage applied herbicides, use ICI Polijet flood Jet Nozzles

b) Soil applied herbicides: Applied on soil before weeds emerge

e.g

- Atrazine
- Diuron
- Simazine
- Candex
- Goal 2E

Advantages of chemical weed management methods

- Can be carried out during the rains when it is too wet for 'jembe'

or tractor cultivation.

- Important when the available labour is required for other urgent operations like pruning, cherry picking etc.
- Allows mulch to persist longer
- Gives the farmer greater efficiency in farm operations

Integrated Weed Management (IWM)

- Refers to a combination of any two or more of the methods discussed
- Above. Most effective, cost friendly and efficient as it is governed by the weed spectrum present in a particular farm. This method is highly recommended

Highlights on Good Agricultural Practices

- Weeds can lead to over 50 % crop loss or total loss in the long run.
- Weeds lower quality by competing for nutrients and moisture, leading to production of either small or rugged beans .
- Some weeds are alternate hosts for coffee insect pests that affect coffee quality
- Some weeds are known to be poisonous
- Indiscriminate use of herbicides should be avoided to prevent residue accumulation





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