Perotis indica

				
***Acroceras munroanum* (Balansa) Henr.** Protein 7.07 % ADF 33.67 % NDF 71.35 % Ca.0.21 % P 0.20 % K1.45 %	***Alloteropsis cimicinaa*** Protein 12.13 % ADF 29.54% NDF 57.59 % Ca. 0.44 % P 0.43 % K 2.42%	***Alloteropsis semialata* (R.Br.) Hitchc.** Protein 8.79 % Fiber 35.36 % Fat 1.72 % ADF 42.44 % NDF 68.00 %	***Andropogon chinensis* (Nees) Merr.** Protein 3.6 % Fiber 42.3% Fat 1.5 % ADF 58.03 % NDF 76.2 %	***Apluda mutica* Linn.** Protein 8.5 % ADF 37.6 % NDF 63.1 % Ca 0.22 % P0.25 % K 1.35 %
				

Arundinella setosa Protein 9.31 % Fiber 33.67 % Fat 1.73 % NDF 44.13% ADF 35.37 % NDF 65.86 %	***Axonopus compressus* (Swartz.) Beauv.** Protein 10.6 % P 0.23 % K 1.43 % Ca 0.32 % ADF 31.5 – 37.1 % NDF 64.6 – 68.8%	***Bothriochloa glabra* Stapf.** Protein 9.8% ADF 35.8 % NDF 62.3 % Hemicellulose 28.48 เปอร์เซ็นต์ เซลลูโลส 33.78 % Lignin 4.7 % Ca 0.25 % Ca 0.17 % K 1.78%	***Brachiaria distachya* (L.) Stapf** Protein 7.9 – 14.5 % P 0.18 – 0.46 % K 0.89 – 3.11 % Ca 0.31 – 0.55 % ADF 27.1 – 35.7 % NDF 51.9 – 68.3 %	***Brachiaria mutica* (Forsk.) Stapf.** Protein 8.3 – 13.4 % P 0.33 % K 2.70 % Ca 0.32 % ADF 34.1 – 38.3 % NDF 62.1 – 68.2 %
				
***Brachiaria paspaloides* (Presl.) C.E. Hubb.** Protein 6.0 % ADF 40.05 % NDF 74.3 % Ca 0.31 % P 0.23 % K 1.98 %	***Brachiaria ramosa* (Linn.) Stapf** Protein 5 - 7 %	***Brachiaria reptans* (L.) Gard. & CE. Hubb.** Protein 9.4 – 14.2 % P 0.29 – 0.36 % K 1.77 – 2.48 % Ca 0.46 – 0.63 % ADF 29.4 –36.4 % NDF 56.3 – 65.9%	***Brachiaria setigera* (Retz.) C.E Hubb.** Protein 8.08 % ADF43.14 % NDF 74.02 % Ca 0.47 % P 0.32 % K 2.17 %	***Cenchrus echinatus* Linn.** Protein 7.37 % Fat 0.84 % Fiber 28.27 % NFE 49.99 % ADF 36.9 % NDF 71.07 %
				
***Centotheca latifolia* (Osb.) Trin.** **Protein** 10.1 –18.5 % P 0.18 – 0.25 % K 1.54 – 2.46 % Ca 0.33 – 0.84 % ADF 29.8 –	***Chloris barbata* (L.) Sw.** Protein 7.2 – 8.5 % P 0.28 – 0.34 % K 1.06 – 1.19 % Ca 0.29 – 0.50 % ADF 36.1 – 42.9 % NDF 65.2 – 76.9 %	***Chloris dolichostachya* Lagasca.** Protein 9.26 % Fiber 28.32 % Fat 1.39 % ADF 38.34 % NDF 73.43 %	***Cymbopogon cambogiensis* Bal.** Protein 11.10 % Fat 4.67 % Fiber 18.86 % Ca 0.35 % P 0.23 % K 1.15 %	***Cynodon dactylon* (L.) Pers.** Protein 9.7 % ADF 31.5 % NDF 67.7 % Ca 0.50 % P 0.12 % K 1.54 %

41.3 % NDF 53.9 - 69.7 %				
				
Cynodon arcuatus **J.S.Presl ex C.B. Presl** Protein 8.88 % ADF 40.73 % NDF 76.65 % Ca 0.37 % P 0.20 % K 1.92 %	***Cyrtococcum accrescens*** **(Trin.) Stapf** Protein 9.8 – 17.7 % P 0.15 – 0.27 % K 1.43 – 2.06 % Ca 0.44 – 0.70 % ADF 30.4 – 38.8 % NDF 53.0 – 62.3 %	***Cyrtococcum patens*** **(L.) A. Camus** Protein 11.4 - 20.4 % P 0.32 % K 1.95 % Ca 0.45 - 0.53 % ADF 29.4 - 42.8 %NDF 56.9 - 67.6%	***Dactyloctenium aegyptium*** **(L.) Willd.** Protein 7.4 – 8.6% P 0.28 % K 1.41 – 1.60 % Ca 0.50 – 0.53 % ADF 27.6 – 42.2 % NDF 55.1 - 75.6 %	***Zoysia matrella*** **(L.) Merrill**
				
Digitaria microbachne **(J. Presl) Henrard** Protein 14.4 -14.8 % P 0.38 % K 1.82 % Ca 0.73 %ADF 33.8 – 36.6 % NDF 61.3 – 65.5	***Digitaria ciliaris*** **(Retz.) Koel.** Protein 11.7 % P 0.29 % K 2.81 % Ca 0.42 % ADF 41.4 % NDF 68.6 %	***Digitaria longiflora*** **(Retz.) Pers** Protein 11.7 % ADF 39.7 % NDF 68.0 % Ca 0.24 % P 0.26 % K 3.13 %	***Echinochloa colona*** **(L.) Link** Protein 14.57 % ADF 37.70 % NDF 63.63 % Hemicellulose 25.93 5 Cellulose 27.86 % Ca 3.90 % P 0.34 %	***Echinochloa crus-galli*** **(L.) P. Beauv. ssp. *hispidula* (Retz.) Honda** Protein 7.3 – 12.1 % P 0.22 % K 1.52 % Ca 0.60 % ADF 31.4 % NDF 63.1%

				
***Echinochloa picta* (Koening) New. Comb.inded** Protein 9.47 % ADF 31.60 % NDF 58.63 % Ca 0.36 % P 0.31 % K 2.34 %	***Eleusine indica* (L.) Gaertn** Protein 9.6 - 10.1 % P 0.25 % K 1.89 % Ca0.70 % ADF 31.1 – 40.2 % NDF 63.3 – 69.5 %	***Eragrostis atrovirens (Desf)*** Protein 5.07 % 36.66 % Fat 1.11 % Ash 5.68 % Carbohydrate (NFE) 51.48 % fiber (ADF) 49.25 % NDF 77.29 % Lignin 8.65 %	***Eragrostis elongata (Willd) Jacq.*** Protein 8.05 % Fiber 35.45 % Fat 2.21 % Ash 8.13 % Carbohydrate (NFE) 46.15 % Ca 0.23 % P 0.15 % K 1.54 % Lignin 6.48 %	***Eragrostis japonica (Thunb ex Murr.) Trin.e*** Protein 6.05 % Fiber 35.39 % Fat 1.11 % Ash 7.09 % Fiber(ADF) 44.80 %NDF 74.22 % Lignin 7.79 %
				
***Eragrostis tenella* (L.)P. Beauv.ex Roem et.Schult** Protein 9.35 % Fat 2.27 % Fiber 29.49 % Ash 5.94 % Carbohydrate (NFE) 43.31 % Ca 0.17 % P 0.16 %	***Eragrostis burmanica* Bor.**	***Eragrostis diplachnoides* (Steud.)Stapf** Protein 8.55 % ADF 37.80 % NDF 70.62 % Ca 0.14 % P 0.16 % K 1.53 % Tannin 0.02 % Hemicellulose 34.1 % Cellulose 29.97 % Lignin 8.59 %	***Eragrostis malayana* Stapf** Protein 13.42 % ADF 32.78 % NDF 58.42 % Ca 0.55 % P 0.45 % K 2.13 % Tannin 0.11 % Hemicellulose 28.25 % Cellulose 30.77 % Lignin 4.21 %	***Eremochloa ciliatifolia* Hack.** Protein 5.34 % Fiber 31.77 % Fat 0.69 % Ash 11.16 % Carbohydrate (NFE) 51.04 % ADF 39.19 % NDF 66.79 % Lignin 6.35 %

				
***Eremochloa zeylanica* Hack.** Protein 7.05 % Fiber 29.32 % Fat 1.13 % Ash 9.80 % Carbohydrate (NEF) 52.69 % ADF 35.66 % NDF 65.14 % Lignin 5.38 %	***Massia triseta* (Nees) Balansa**	***riochloa procera* (Retz.) C.E. Hubb.**	***Eustachys tenera* (J.S.Presl) Camus.** Protein 9.32 % Fiber 30.14 % Fat 3.30 % Ash 11.38 % Carbohydrate (NFE) 45.58 % ADF 37.33 % NDF 71.52 % Lignin 6.67 %	***Flemingia brevipes Craib*** Protein 21.09 % ADF 33.84 % NDF 69.03 % Cellulose 16.51 % Lignin 17.33 % Ca 0.85 %
				
***Hemarthria compressa* (Linn. f.) R.Br.** Protein 9.9 – 10.3 % P 0.23 % K 0.9 % Ca 0.31 % ADF 32.0 – 32.6 % NDF 63.3 – 65.3 % DMD 60.9 % (Nylon bag) Lignin 4.6 %	***Heteropogon contortus* (L.) P. Beauv.ex Roemer & Schultes** Protein 6.8 % P 0.15 % K 1.50 % Ca 0.13 % ADF 51.1 % NDF 78.2 % DMD (Nylon bag) 47.7 % Tannin 0.11 %	***Hymenachne acutigluma* (Steudel) Gilliand** Protein 11.5 – 16.8 % P 0.28 % K 2.24 % Ca 0.25 – 0.3 % ADF 29.3 – 35.2 % NDF 58.2 – 65.3 % DMD 60.5 % (Nylon bag) Lignin 4.7 %	***Hymenachne aurita* Presl ex Nees Backer** Protein 11.5 – 16.8 % P 0.28 % K 2.24 % K 0.25 – 0.3 % ADF 29.3 – 35.2 % NDF 58.2 – 65.3 % Lignin 4.7 %	***Ischaemum barbatum* Retz.** Protein 8.4 - 11.9 % P 0.15 – 0.25 % K 1.24 – 1.94 % Ca 0.40 – 0.56 % ADF 32.7 - 35.5 % NDF 63.1 – 67.2 % Lignin 4.2 – 5.5 %

				
Leersia hexandra SW. Protein 13.98 % ADF 31.30 % NDF 60.95 % Ca 0.39 % P 0.27 % K 1.90 % Hemicellulose 31.02 % Cellulose 26.77 % Lignin 4.1 %	***Leptochloa panicea* (Retz.) Ohawi.** Protein 11.01 % ADF 30.80 % NDF 62.21 % Hemicellulose 32.55 % Cellulose 27.47 % Ca 0.45 % P 0.39 % K 1.45 % Lignin 4.52 % Tannin 0.13 %	***Melinis repens* (Willd.) Zizka** Protein 8.2 – 8.5 % P 0.37 % K 1.42 % Ca 0.35 % ADF 38.6 – 39.8 % NDF 68.8 – 69.9 % Lignin 5.7 %	***Microstegium ciliatum* (Trinius) A. Camus** Protein 8.0 – 13.1 % ADF 38.4 % NDF 62.4 % Lignin 6.3 %	***Microstegium petiolare*** Protein 7.27 % Fiber 33.25 % Fat 2.41 % Ash 8.32 Carbohydrate (NFE) 48.75 % Fiber (ADF) 36.72 % NDF 67.12 % Lignin 6.16 %
				
***Mnesithea glandulosa* (Trin.) Kon. & Sos.** Protein 6.5 - 7.0 % P 0.09 – 0.11 % K 1.23 – 1.77 % Ca 0.21 – 0.30 % ADF 37.2 – 45.5 % NDF 67.5 – 73.6 % Lignin 5.5 – 6.2 %	***Neyraudia reynaudiana* (Kunth) H. Keng ex Hitchc.** Protein 6.2 % Fiber 44.0 % Fat 1.0 % Ash 4.0 % Carbohydrate (NFE) 55.1 % ADF 51.4 % NDF 78.5 % Lignin 8.8 %	***Oplismenus compositus* (L.) P. Beauv.** Protein 8.42 % ADF 32.52 % NDF 59.10 % Ca 0.42 % P 0.59 % K 1.53 %	***Ottochloa nodosa* (Kunth) Dandy** Protein 9.6 – 13.5 % P 0.12 – 0.26 % K 1.48 – 1.88 % Ca 0.27 – 0.42 % ADF 29.8 – 39.0 % NDF 57.8 – 68.6 % Lignin 4.7 – 7.8 %	***Panicum repens* Linn.**

				
Panicum cambogiense **Balansa**	***Panicum elegantissimum*** **Hook. f.**	***Panicum incomtum Trin***	***Panicum notatum*** **Retz.**	***Paspalum longifolium*** **Roxb.**
				
Paspalum scrobiculatum **Linn.**	***Paspalum conjugatum*** **Bergius**	***Paspalum distichum*** **Linn.**	***Paspalum orbiculare*** **G. Forst.**	***Perotis indica*** **(L.) Kuntze**
				
Phragmites vallatoria **(Pluk. ex L.) Veldkamp**	***Pogonatherum crinitum*** **(Thunb.ex Murr.) Kunth**	***Pogonatherum panicum***	***Pseudoraphis spinescens*** **(R.Br.) Vickery**	***Setaria palmifolia*** **(Koen.) Stapf.**

				
***Setaria flavidum* (Retz.) A. Camus**	***Setaria geniculata* (Lamk) P. Beauv.**	***Setaria punctata* (Burm.f.) Veldkamp**	***Setaria verticillata***	***Sorghum halepense (Linn.) Pers.***
				
***Stenotaphrum helferi* Munro**	***Themeda triandra* (Forssk.)**	***Themeda villosa* Durand & Jackson**	***Thysanolaena latifolia* (Roxb. ex Hornem) Honda**	***Vietnamosasa ciliata* (A. Camus) Hguyen**
				
***Vietnamosasa pusilla* (A.Cheval. & A. Camus) Hguyen**				

***Apluda mutica* Linn.**

Protein 8.5 % ADF 37.6 % NDF 63.1 % Ca 0.22 % P0.25 % K 1.35 %

 ***Brachiaria mutica* (Forsk.) Stapf.**

Protein 8.3 – 13.4 % P 0.33 % K 2.70 % Ca 0.32 % ADF 34.1 – 38.3 % NDF 62.1 – 68.2 %

 ***Cenchrus echinatus* Linn.**

Protein 7.37 % Fat 0.84 % Fiber 28.27 % NFE 49.99 % ADF 36.9 % NDF 71.07 %

 ***Cynodon dactylon* (L.) Pers.**

Protein 9.7 % ADF 31.5 % NDF 67.7 % Ca 0.50 % P 0.12 % K 1.54 %

 ***Zoysia matrella* (L.) Merrill**

 ***Echinochloa crus-galli* (L.) P. Beauv. ssp. *hispidula* (Retz.) Honda**

Protein 7.3 – 12.1 % P 0.22 % K 1.52 % Ca 0.60 % ADF 31.4 % NDF 63.1%

 ***Eragrostis japonica (Thunb ex Murr.) Trin.e***

Protein 6.05 % Fiber 35.39 % Fat 1.11 % Ash 7.09 % Fiber(ADF) 44.80 %NDF 74.22 % Lignin 7.79 %


Protein 8.4 - 11.9 % P 0.15 – 0.25 % K 1.24 – 1.94 % Ca 0.40 – 0.56 % ADF 32.7 - 35.5 % NDF 63.1 – 67.2 % Lignin 4.2 – 5.5 %


***Panicum repens* Linn.**

 ***Perotis indica* (L.) Kuntze**

Perotis indica

Ischane dispar 

Isachane dispar

After completing this Lesson, you have learned to answer:

1. When the first schedule for weed control activity in sorghum should start?
2. How pre-sowing rainfall or irrigation helps in better weed control in sorghum?
3. What methods of weed control are practiced in sorghum cultivation?
4. List the cultural practices that help in reducing the weeds in sorghum crop?
5. What is the correct schedule for manual weeding in sorghum crop?
6. What is the correct schedule for intercultivation to take care of weeds in sorghum crop?
7. What precautions one should take to use herbicides for weed control in sorghum crop?
8. List the herbicides based on their time of application?
9. Give an example of pre-planting herbicide for sorghum weed control?
10. Describe your recommendation for one pre-emergence herbicide for sorghum weed control?

Weed-free field for sowing

Weed control need to be practiced in sorghum crop even before sowing so that the plants grow without any weed competition from germination onwards.

That means the first weed control activity starts even before sowing sorghum.

Weed-free environment

in the early stages

The weed seeds in the soil are allowed to germinate with the first rainfall and then the final harrowing or plowing is carried out.

This practice will provide a weed free environment for vigorous and robust growth for the sorghum seedlings.

Weed-free crop

Weeds are not allowed to grow during the first 45 days of growth of sorghum plants as this is the most critical weed competition period.

Late weeding by farmers is due to many factors:

1. Wait for weeds to become fodder to feed the cattle
2. Erratic rainfall in black soil regions
3. Unavailability of labor in peak periods
4. Cost of labor etc.

However, it should be remembered that delaying weeding will lower the yield proportionate to the delay.

There are 3 methods of weed control practices:

1.Control through crop cultural practices

2.Manual or mechanical control

3.Chemical control

Efficient and effective weed control can be achieved by wisely combining the above methods of weed control practices.

Cultural practices:

A good crop cover by adopting right spacing between rows and within the row will smother the weed growth.

For this adopt the recommended spacing of 45 cm between rows and 12 cm between the plants within the row.

Example of mulching with straw

Mulching the soil surface in between rows with crop residue material like straw etc. may prevent The germination of weed seeds and at the same time smothers the established young weeds. This mulching practice also helps in conserving the soil moisture.

Growing sorghum crop every year in the same field (monocropping) encourages injurious weeds to multiply like Striga and dominate in the field. Such weeds will reduce sorghum crop yields much more than the competition from a wide spectrum of weeds.

So, adopting proper crop rotation practices will help in overcoming the domination of certain weeds and lessening the weed competition in sorghum crop.

Sorghum-Pigeonpea intercropping

Intercropping practice in sorghum crop not only provide the monetary and land utilization advantages but also help in smothering the weeds with good crop cover over the land surface.

Manual weeding:

Manual weeding

Manual weeding is a very common practice to control weeds in sorghum crop.

Timely weeding is important than the frequency of weeding. It is necessary to keep the crop free during the first month of its growth through manual weeding.

Hand hoeing to control weeds

Hand hoeing is an effective method adopted widely to control weeds in the inter - row spaces of line-sown crop.

This method provides excellent physical condition to the crop growth by way of soil aeration through stirring of the soil .

First hand weeding is done at about 20 - 25 days after sowing and should be repeated at fortnightly intervals up to 45 days of the crop.

Manually operated implements like wheel push hoe are also used to control weeds in sorghum.

Mechanical weeding:

Intercultivation using

Blade harrowing in relatively dry and loose soil between the rows of sorghum, is a widely followed method for effective weed control as this operation cuts the root system of weeds resulting in desiccation of weeds.

Duck-foot harrows are also used for intercultivation in sorghum.

The first intercultivation is done about three weeks after sowing and the second and the third about a fortnight and a month later.

No interculture would be possible when once the plants grow tall.

Chemical control:

The delay in manual weeding and intercultivation may be delayed due to the uncertain weather conditions.

Therefore, chemical weed control has found a place in sorghum weed production.

Chemical control or Herbicide application is advantageous in case of non-availability of labor and/or cost of labor for manual weeding is very high.

Use of correct herbicides will provide completely weed-free situation to the crop where as manual or mechanical weeding can be done only after the emergence of weeds.

Use of chemicals (herbicides) to control weeds should be based on their comparative advantage over the manual and mechanical control of weeds.

Herbicide application requires some knowledge about the use of such chemicals. Improper use of herbicides may lead to the complete loss of the crop.

The farmers need to understand the proper use and application of herbicides before applying them to control weeds in sorghum crop.

Satisfactory control can be obtained by combining timely cultivation, crop rotation and herbicide applications.

However, efficient and cost-effective weed control can be achieved by using combination of herbicides or combining manual and herbicide control methods.

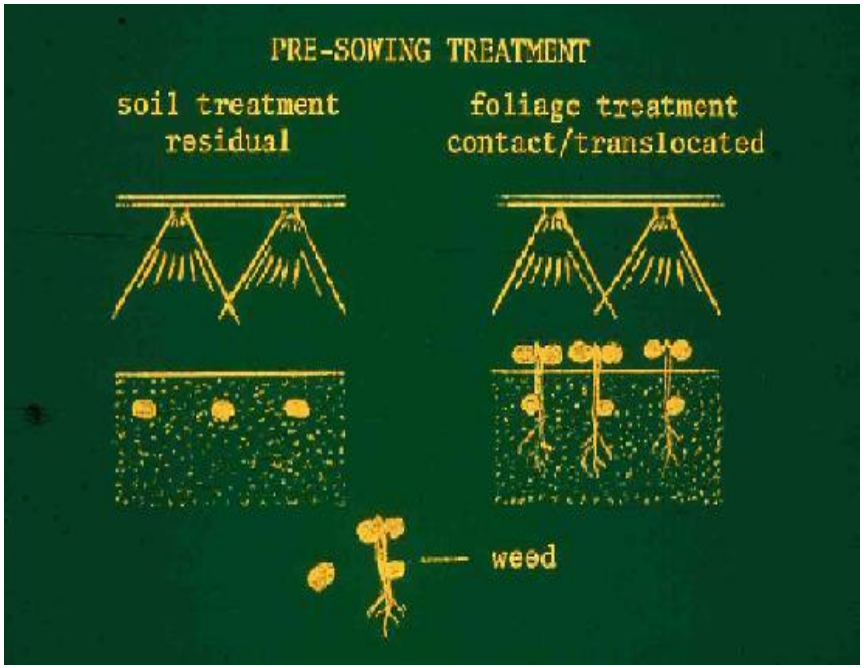
Depending on the time of application, herbicides are grouped as:

1.pre–planting (incorporated into the soil before sowing of the crop) herbicides,

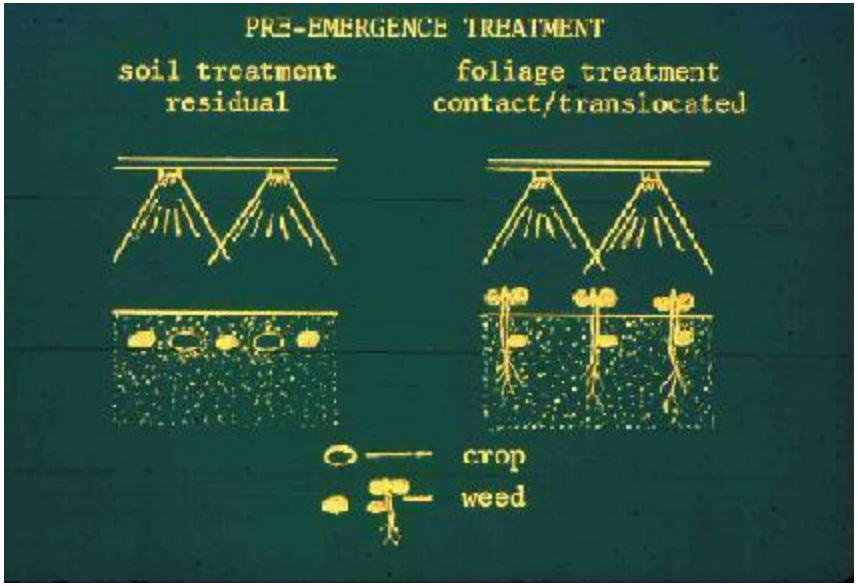
2.pre–emergence (after sowing but before emergence of seedling) herbicides,

3.post–emergence (after emergence of weeds and the crop) herbicides.

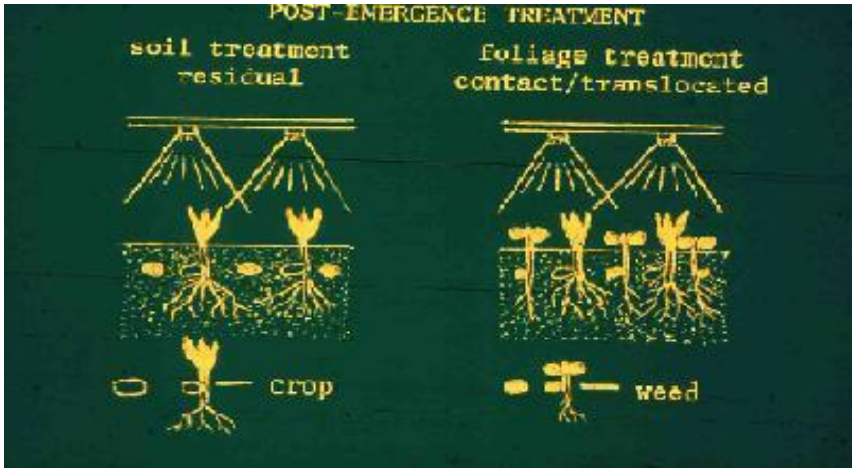
Pre–sowing/planting (incorporated into the soil before sowing of the crop) application of herbicides.



Pre–emergence (after sowing but before emergence of seedling) application of herbicides.



Post–emergence (after emergence of weeds and the crop) application of herbicides.



Herbicides should be selected based on specific weed and grass problems encountered in each field and rotational crops to be planted following the sorghum harvest.

It is very difficult to control grass-type weeds with post-emergence herbicides so plan to use a pre-emergent herbicide if grass-type weeds are expected.

In general, herbicides like Atrazine, Propazine, Prometryne and Simazine are recommended for weed control in sorghum.

Atrazine usually gives better control weeds than Propazine but Propazine was found to be safest.

If the field is weedy with annual grasses and broad leaved weeds before sowing sorghum:

Spray Praquat (Gramoxone) on the weeds at 0.5 to 1.5 liters per ha depending on the weed density.

Consult the product label prior to use.

If the field is weedy with annual grasses and broad leaved weeds before sowing sorghum:

If sedges like Cyperus spp., Bermuda grass, Johnson grass,field bind weed dominate in the field, spray

Glyphosate (Roundup) at 0.5 to 1 liter. Direct the spray on the weeds as Glyphosate becomes inactive in the soil.

Consult the product label prior to use.

Pre-emergence application:

Atrazine or Propazine or Prometryne at 1.0 kg a.i./ha is recommended to control emerging weeds after the sowing of sorghum.

There should be optimum soil moisture at the time of application of Atrazine.

Pre-emergence application:

Application of Metalochlor 1 kg a.i./ha found to control the weeds effectively and increase the yield and net

income of sorghum intercropped with pulses like Cowpea / Black gram / Green gram (mungbean).

Post-emergence application:

Low rates of 2,4-D at 0.5 to 1.0 kg/ha may be applied when the plants are between 10 to 30 cm tall.

Spraying later time affects yield by reducing seed set.

Early treatment can also be injurious by damaging the root system.

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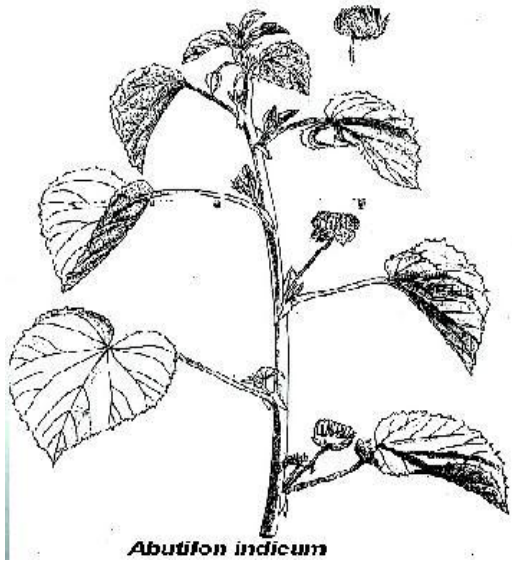
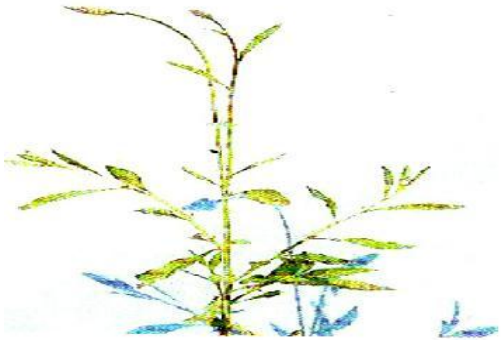


Abutilon indicum Indian mallow

Alysicarpus sp. One-leaf clover

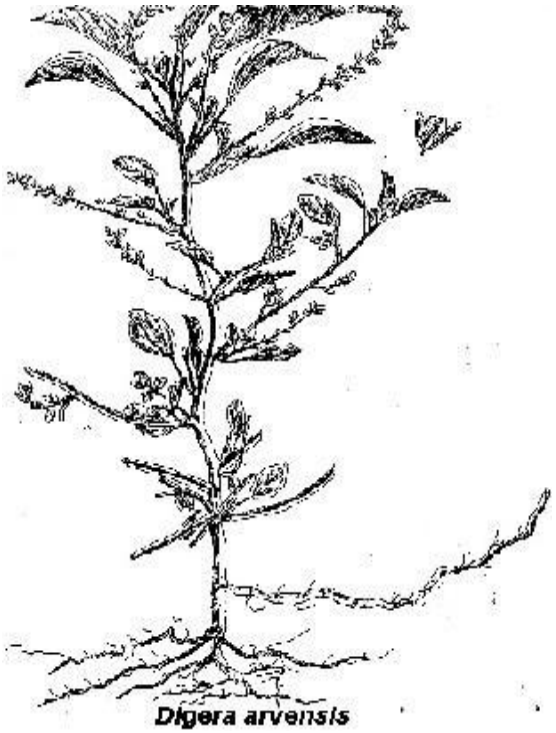
Argemone mexicana Mexican poppy



Celosia argentina White cock's comb

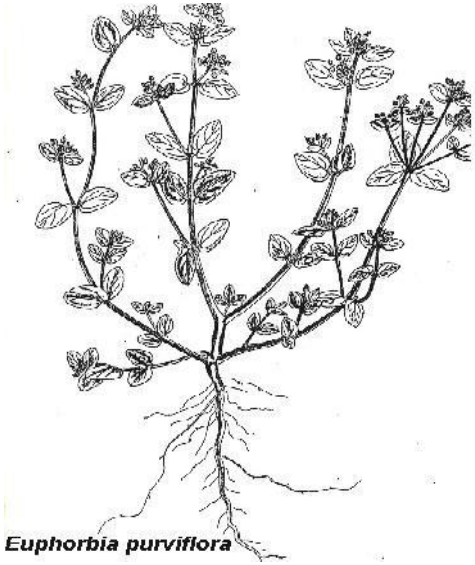
Borreria articularis Button plant

Cleome sp. Wild spider flower



Digera arvensis Kundra

Corchorus olitorius Jew's mallow



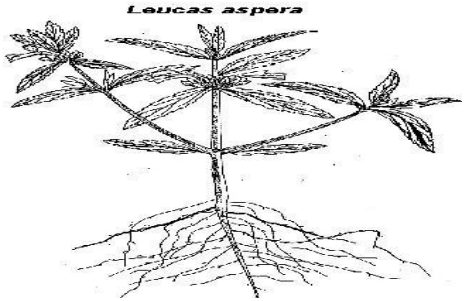
Euphorbia purviflora

Euphorbia hirta Spurge

Portulaca oleracea Common purslane

Portulaca pilosa

Vernonia cinerea Little iron weed



Leucas aspera Dronapushpi

Xanthium strumarium Cocklebur

Amaranthus spp. Pigweed

Anagallis arvensis Scarlet Pimpernel

Bidense pilosa Spanish needle

Mollugo verticillata Carpet-weed

Commelina spp. Benghal dayflower

Eclipta prostrata

Eclipta alba

Ipomea spp. Morning glory

Tridax procumbence Tridax daisy, wild daisy

Chloris barbata Swollen Finger grass

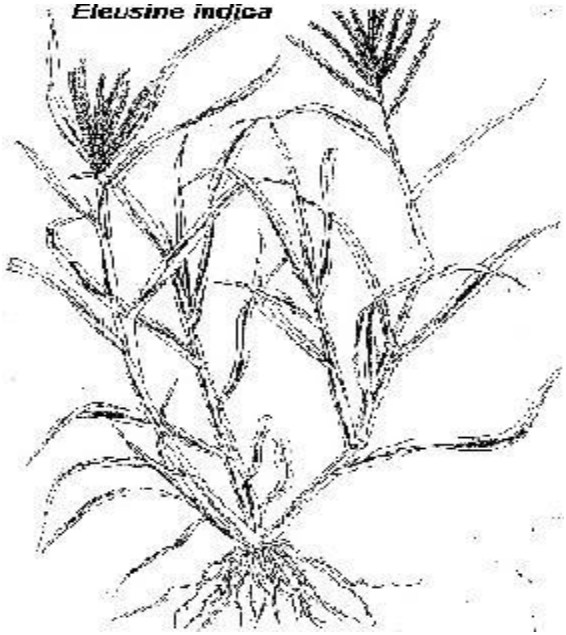
Chloris gayana Feather Finger grass

Digitaria sanguinalis Crabgrass

Dactyloctenium aegyptium Crowfootgrass


Echinocloa spp. Barnyard grass

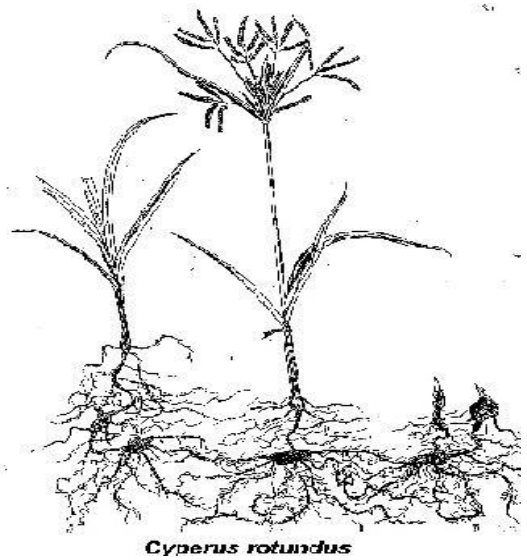
Paspalum distichum. Water couch



Eleusine indica Goose grass

Eragrostis spp. Lovegrass

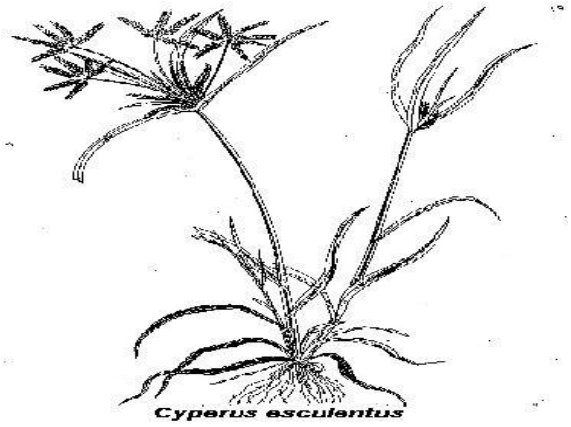
Setaria spp. Foxtail



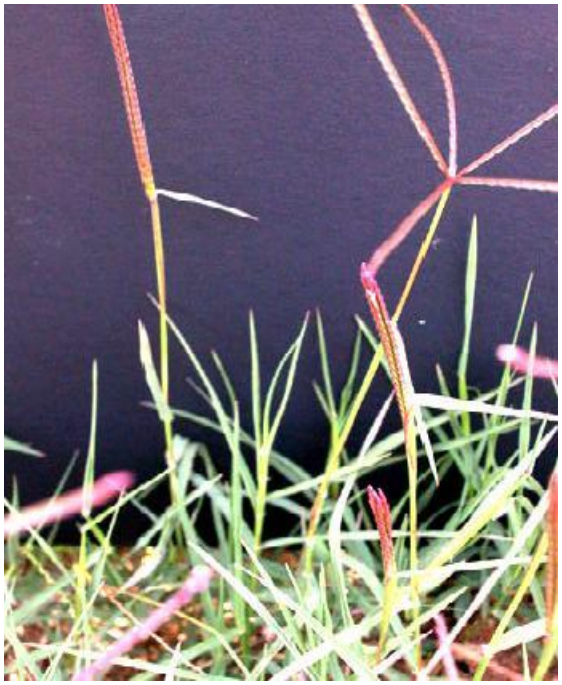
Cyperus rotundus Purple nut sedge

Cyperus compressus Nut sedge

Cyperus defformis Nut sedge



Cyperus esculantus Yellow nut sedge



Cynodon dactylon Bermuda grass

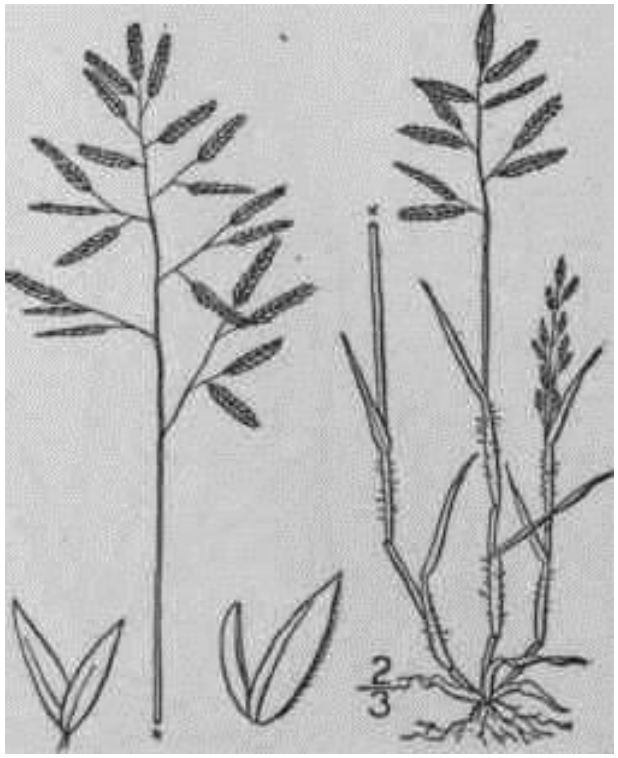
Andropogon glomeratus

Andropogon glomeratus sub sps pumilus

A.depressa *adscensionis* L.

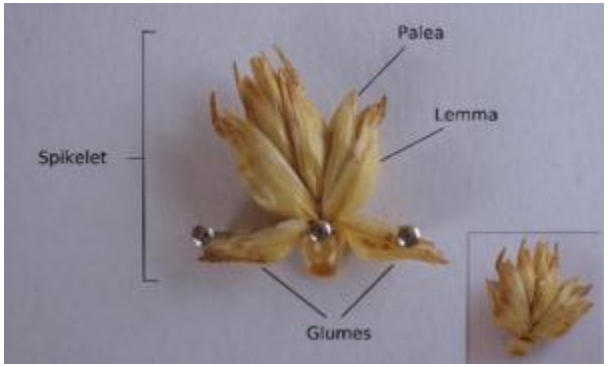
Cymbopogon martini

Cyperus triceps



Eragrostis

Tragus roxburghii


Palea
Lemma
Spikelet
Glumes

O.canum