CHAPTER -III
INFORMATION ABOUT WEED PLANTS
AND LEAFY VEGETABLES UNDER
INVESTIGATION
Dominant Weeds of the Marathwada Region

(1) *Parthenium hysterophorus* L.

*Parthenium hysterophorus* L. (Family Asteraceae - Compositae) is a native of tropical America, from Florida to Texas. It is believed to have been introduced into India with PL-480 foodgrains imported from the U.S.A. Locally it is known in Marathi as chatak-chandana, osadi, Gajar gawat, safet topi or more popularly as the Congress grass. It is an erect herb, 1 to 1.5 metre high; leaves spreading out like carrot, covers a large soil surface at the base, in the initial stage of its growth. A single flower head consists of numerous minute florists. The peripheral ray-like flowers are fertile. The fruits, which looks very much like a seed, has two lateral floats. These floats enable rapid and easy spread of the plant over a very considerable area. On moist waste lands, this weed flowers and fruits throughout the year.

Dry powder of the plant can be used in the preparation of oxalic acid. The dried fibre contain 1.6-2.41 nitrate, leaf protein concentration contains 48-54, ether extract 11.13, ash 6-8 %, carotene 0.4-0.6, xanthophyll 0.7-0.9 mg/g on dry basis. It has dominated the native plants and now has become a troublesome weed throughout the region.
Fig. *Parthenium hysterophorus* and *Achyranthes aspera* used for green manure and compost manure.

a) *Parthenium hysterophorus* L.

b) *Achyranthes aspera* L.
(2) *Euphorbia prunifolia* (Jacq.), Family - Euphorbiaceae

It is commonly known as Dudhani. It is native of tropical America and now naturalised as a common weed in and around gardens. Erect annual, 30-90 cm tall, leaves oblong, lanceolate, elliptic lanceolate, 6-10 x 4-6 cm entire and occasionally lobed acute, inflorescence involves numerous cythia, shortly pedicellate, aggregated into dense axillary or terminal globose cymes, involucres green, capsules 4-5 cm across, glabrous coci keeled on the back, flower and fruits in September to June.

(3) *Cassia tora* L.

Commonly called as Tarwad, Takla or Tarwat. It belongs to the family Fabaceae. Anuual herb with under shrubs, stems nearly glabrous, leaves alternate, pinnately compound, with 3 pairs of obovate leaflets, leafs pair increasing in size from the base upwards, subsessile with shortly petioled, petiolar gland between lower parts of leaflet, stipules setaceous, flowers axillary paired with solitary, few-flowered racemes, petals yellow, subequal, oblong, fruits 4-angled very slender, 15-30 cm long dehiscent and incompletely septate with numerous seed. Seeds thick-brown, oblong shiny truncate at ends with diagonal stripe on side, flower during
Fig.  *Cassia tora* and *Euphorbia prunifolia* used for green manure and compost manure.

a) *Cassia tora* L.

b) *Euphorbia prunifolia* Jacq.
September to October and fruit in November-December. The tender leaves are used as bhaji, when young the seeds are used as remedy against ring-worm. The dried seeds are used as coffee. Very common on waste land along road-sides.

(4) *Achyranthes aspera* L.

*Achyranthes aspera*, commonly called as Aghada, is very common weed, belong to the family Amaranthaceae. It is found almost every where. A coarse weed, 30-90 cm high, stem erect simple with slightly branched, leaves variable elliptic-ovate, usually rounded at the apex tomentose, flowers many, greenish-white, sharply deflexed against stout pubescent rachis of the terminal spikes, stamens 5, staminode truncate, auricle oblong, enclosed in the hardened perianth. Seed subcylindrical with a truncate apex brown, flowers and fruits from October to January.

It is very useful in dropsy, piles bial and colic in children. It is also used as cure for cough, the seeds and leaves are used in hydrophobia and on insect bite. All parts of plant are used in Ayurvedic medicine.

Common weed of waste lands, road sides and around the fields.

(5) *Acalypha indica* Linn. (Kuppi, Khokali)

It belongs to the family Euphorbiaceae, found almost
Fig. *Tephrosia hamiltonii* and *Crotalaria notonii* used for green manure and compost manure.

a) *Tephrosia hamiltonii* Drumm.

b) *Crotalaria notonii* Wt. & Arn.
everywhere in the country. Stiff erect, 45-65 cm high, stem pubescent, leaves long-petioled, rhomboidal ovate and spreading with serrate margins, acute; inflorescence in axillary spikes with foliaceous concave sub-orbicular, cuneiform many-nerved, toothed bracts, green, female flowers in the lower part of the spike, the top at the spike bearing male and ebracteate flowers, capsule greenish, hispid, concealed by the bract, turn brown on maturity, flowers and fruit during August to December.

A common weed on waste lands along bank of water sources, on bunds of farms, on old walls of houses etc. It is an useful remedy for bronchitis, asthma, pneumonia, and is also a laxative.

(6) *Tephrosia hamiltoni* (Drumm.), Family - Fabaceae.

Commonly called as Sharpunkha, Unhali. It is very common in grasslands and on waste land along roadside, under shrub 30-40 cm tall, stems angled, leaves pinnate, 6-10 cm long, leaflets 9-15 ob lanceolate, flowers pink in extra axillary raceme, pods ca 4 x 0.4 cm, 4-6 seeded, flowers and fruits July to December. Root, leaves and seeds are used in medicine. Very common along road-side and on waste-land.
Fig. *Acalypha indica* and *Sida glutinosa* and used for green manure and compost manure.

a) *Acalypha indica* L.

b) *Sida glutinosa* L.
(7) *Crotalaria notonii* Wt. and Arn.

It is commonly called as Diwali, seen in field and waste places, belong to the family Fabaceae (Papilionaceae). An annual herb, diffuse with slender erect branches, 30-90 cm high, branches with oppressed and spreading pubescence, leaves 3-foliolate, leaflets oblanceolate, 10-17 mm inflorescence raceme, terminal and leaf opposed, 25-50 mm long, flowers axillary, small and yellow calyx, 4-6 mm, upper teeth widely separate, corolla 8 to 10 mm, pod small somewhat globose, 4 mm diameter, grooved and shortly beaked, pubescent, 2 seeded, seeds reniform, pale yellow, flowers during rainy season and fruit during October-November. Frequent on slopes of hills, around fields and on waste-land.

(8) *Sida mysorensis* Wt. & Arn. (*Sida glutinosa* Roxb.)

*Sida glutinosa* is belonged to the family Malvaceae, commonly found under the shade of trees and on wet soil along stream banks. Erect woody annual, 30-90 cm tall, glutinous hairy, leaves broadly ovate cordate, 7 x 6 cm, flowers solitary axillary with in short raceme, pale yellow calyx, 6 to 10 mm across carpet, trigonous smooth, flowers and fruit September to February.
The Leafy Vegetables

(1) *Amaranthus hybridus* L. (*Amaranthus paniculatus* L.)

It is belonged to the family Amaranthaceae. Handsome annual 1-2 m tall. Leaves elliptic lanceolate, 5 x 15 x 27 cm acute with acuminate, flowers numerous in dense thyrsoid yellowish with red coloured spikes, the central spike the longest utricles 3 mm long, ovoid narrowed at the tip, circumsessile about the middle. Tepals are often variously coloured such as red, pink, yellow, etc. It is commonly called as Rajgira.

Planted for vegetable and edible seeds, flowers and fruits September to January.

(2) *Amaranthus spinosus* L.

It is also belonged to the family Amaranthaceae and commonly called as Katemath. Erect glabrous annual, 3 to 60 cm tall, stems striated usually green, with sharp axillary spines, calyx 1-1.5 cm long, leaves ovate or lanceolate, 2.8 x 1.3 cm flowers green in dense axillary clusters and axillary and terminal rather interrupted, 6-12 cm long spike, tepals ovate-oblong, all acute, bristle pointed, capsules ovoid thickened at the top, circumciss about the middle, membraneous, rugose, seeds shining brown, discoid.
Common on waste land, barren fields and old walls, flowers and fruits July to December, roots are used in Ayurvedic medicine.

(3) *Digera muricata* L. (*Digera arvensis* L.)

**Family - Amaranthaceae**

It is commonly called as Tandulja. Erect or procumbent glabrous herb, about 45 to 120 cm tall or more. Leaves broadly ovate entire with undulate margin, 6.7 x 5.6 cm abruptly narrowed at base and tapering into 4-7 cm long petiole, obtuse at apex. Flowers green in dense, axillary clusters, utricle ovate with broad seedless top, regulose membranous. Tepals ovate, green with white or pink margins.

Cultivated for leafy vegetable, also occurring as weed on waste land; flowers and fruits August to January.

(4) *Atriplex hortensis* L.

It is commonly called as Chandan batva, and belong to family Chenopodiaceae. Stout, erect, branched, glabrous herb, 0.5-1 m tall, branches striate, tinged with red, lower leaves opposite, the upper alternate, triangular, or rhomboid 3-12 x 2-6 cm tender ones often tinged with red, margin angled or dentate, flowers polygamous shortly pedicled in axillary and terminal more or less panicled racemes.
Largely cultivated as a vegetable crop, flowers and fruits October to February.

(5) *Raphanus sativus* L.

It is commonly called as Mula, belong to family Brassicaceae (Cruciferae). Annual or biannual with thick fleshy root stem, 60-90 cm tall, much branched, more or less glaucoles. Leaves lyrate divided variable, flowers white or lilac mostly dark yield in terminal raceme crowding at ends and overlapping the buds. Fruit siliqua, 3-9 cm long, 1-6 seeded, beaked more or less constricted between two seeds, globose.

Cultivated throughout the region for fleshy roots and fruits used as vegetable, flowers and fruits November to February. Two principal kinds of this species are recognised (1) long rooted raddish and (b) the turnip rooted raddish.

(6) *Trigonella foenum-graecum* L.

It is commonly known as Methi, belong to family Fabaceae. Erect annual with pinnately 3-foliolate leaves and white or pale yellow flowers, pods 5-8 cm long, flattened beaked many-seeded. Cultivated throughout the region for vegetable and for seeds used in cooking, flowers and fruits February to April or throughout the year.
(7) Colocasia esculenta L.

It is commonly known as Chamkura, belong to family Araceae. Perennial herbs with tuberous or elongated rhizomes with stolons. Leaves large with a broad triangular basal sinus, 15-40 x 12-30 cm, acute or shortly acuminate, petioles, 30-60 cm long, purplish; spathes lanceolate, inflorescence spadix, fruit red globose cultivated in kitchen garden as a vegetable, also found in wild condition.

(8) Spinacia oleracea L.

Spinacia oleracea is commonly known as Palak. It belongs to the family Chenopodiaceae. Erect annual herb, stem usually red, striate glabrous, leaves oblong, 4-10 x 2-8 cm obtuse, entire or broadly pinnatifid, green or tinged with red on veins, flowers greenish in terminal racemes, pedicellate in distinct, whorls supported by small linear oblong leaves. Nut 2-3 mm long, acutely trigonous or narrowly winged.

Cultivated as a leafy vegetable. Flowers and fruits November to April, occasionally up to June.

FOOD CROPS

Lucerne

Lucerne, common purple alfalfa (Medicago sativa L.,
family Fabaceae, sub-family Papilionaceae) also called lasun ghas, purple medik, snail clover, Burgundy or Chilean clover is by far the most important of the cultivated species. It is a deep rooted, perennial herb with a thick trunk root, from the root grown arise a number of erect stems carrying trifoliolate leaves, 30-60 cm tall; stems angular, pubescent, stipules linear; leaflets lanceolate to elliptic-oblong, dentate near obtuse apex, glabrous above covered with long white hairs beneath. Flowers in dense axillary, peduncled spicate racemes, bracts filiform, corolla 8-12 mm long; pods 2-3 times coiled, 12-20 mm long; seeds 5-10, globose brown, purple flowers in clusters of ten to twenty. It demands sunshine and tolerates high temperature so long as they are not combined with high air moisture. The plant is generally grown alone, but also occurs in mixtures with grasses or other legumes. It is used for green fodder, for conservation as hay, silage or dried, for pasture, but does not tolerate close grazing very well. Lucerne is an excellent soil improver; it adds substantial quantities of nitrogen to the soil and its extensive and deep root system opens up and drains the subsoil for subsequent crops. Lucerne is grown extensively under irrigation and it has very good capacity of regeneration.
The potential of lucerne as a feed and food protein source is greater than other crop plants. Hence, considerable amount of work has been / is being carried out in countries where it is grown. It is grown in the districts of Nasik, Ahmednagar, Poona, Jalgaon and Aurangabad. It is valued as a green fodder especially for horses and its cultivation is confined to military farms and irrigated areas rearing and remount depots and state Government farms; it is also grown in scattered patches by farmers for feeding milch animals.

Maize

The maize and corn (Zea mays L.) belong to the family Poaceae. The plants grow to the height to 1.5 to 3 metres depending upon variety. They also bear tillers, if the main shoot is damaged or even otherwise, however, it is greatly influenced by soil and climatic conditions. The seminar roots are later replaced by permanent adventitious roots, that are originated from the crown present at the end of mesocotyl. The leaves grow alternately on the opposite sides of the stem. They bear small hairs on them and number of leaves varies from 10 to 20. The width varies greatly with the varieties, fertility status of the soil, climatic conditions and management practices etc. It bears two types
of inflorescence staminate and pistillate. The styles are very long which came out of the husk and are collectively known as silk. The flowers are either cross or self pollinated and the pollination is brought about by wind or gravity.

The maize kernels are morphologically a fruit because it develops from the ovary in which the ovary wall adheres tightly to the seed coat.

Since it belongs to C₄ group of plant kingdom it needs bright sunny days for an accelerated photosynthetic activities and rapid growth of plants but this has to be associated with an abundant water supply failing which the crop will start wilting or withering. Prolonged cloudy period is harmful for the crop but an intermittent sunlight and cloud and rain is the most ideal for its growth.

Maize crop required deep, fertile, rich in organic matter and well drained soils. The soil should be medium textured with good water holding capacity. The crop is very sensitive to waterlogging. From the results of the various field trials it is observed that a loam or silt loam surface soil and a brown silt clay loam having fairly permeable sub-soil are the ideal soil types. Thus the ideal soil is the one which is neither clayey nor sandy and pH between 6.5 and 7.5.
The crop is grown rainfed during kharif season and water stress at early growth stages results in an elongation of roots which ultimately induce drought resistance in plants, through it delays flowering of the plants.

Water logging is highly detrimental for the crop for excess water and water logging for more than 3 or 4 days may result in a yield reduction to the extent of 50 percent or even in total crop failure depending upon severity of water logging. The losses of water logging may be averted by growing crop on ridges in poorly drained fields and by giving light and frequent irrigation to the crop. The hardiness in plants during kharif season may also be induced by growing the crop at least 15 to 20 days earlier than the onset of the monsoon.

Maize needs heavy manuring, 25 to 28 cartloads of cattle manures or compost per hectare is required. 55 kg/ha of nitrogen 110 to 170 kg/ha of ammonium sulphate as top dressing, 50-75 kg/ha of potassium and phosphorus at the sowing time is required with optimum and well distributed rain. Irrigation of the crop at 10-15 days interval is required. At the tasseling stage, water requirement is highest and at the ripening stage, irrigation should be less.