

**“Horticulture, Forestry and Herbal Technology”**

**B. Sc. III Sem VI Sec II**

**“Gardening and Ornamental Plants”**

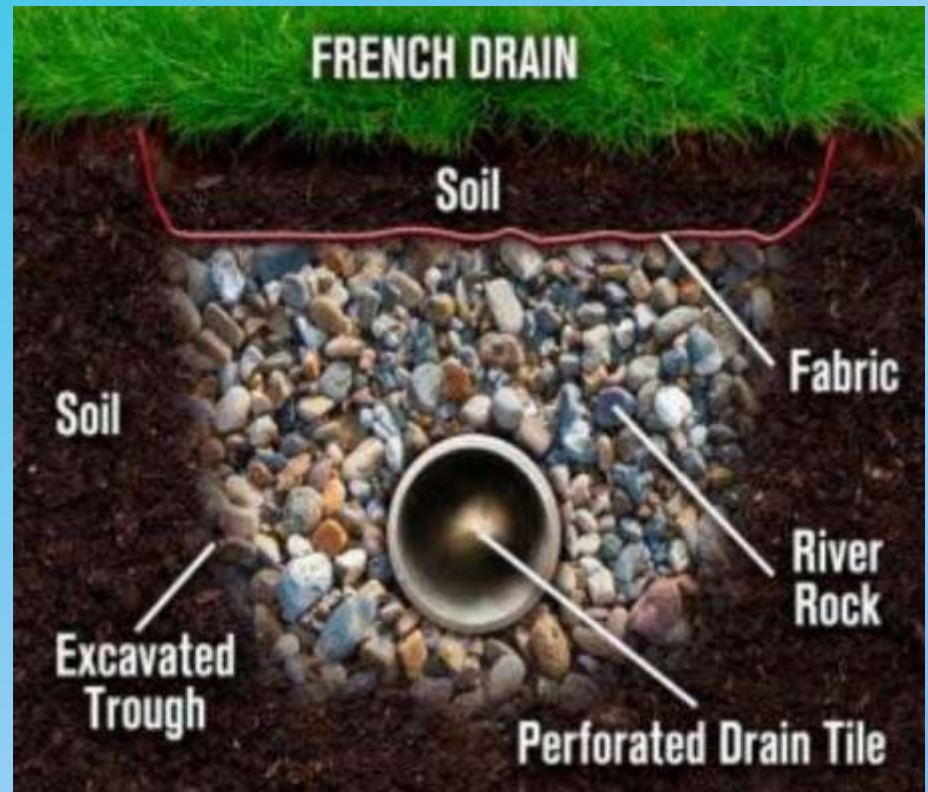
**by Dr. A. R. Alvikar**

## “Landscape Gardening” Drainage Systems

- ❖ Drainage systems are installed to control the amount of water flow in gardens and landscapes, lawns etc.
- ❖ It is natural or artificial removal of surfaces and sub-surface water from an area with excess water.

### ❖ 1. French Drain

It is a simple trench about 4 feet deep in to the soil surface which is filled with a permeable material like gravel, in which water seeps into a perforated pipe and is diverted away from the main construction. It is typically used for residential applications to prevent surface water from penetrating and damaging the building constructions.



❖ The French drain is one of the most popular outdoor drainage systems and it can be customized based on the capacity of your outdoor space. The size of the pipes will give an idea, volume of water that is being drained.



## 2. Dry Well System

❖ It is an environmental friendly lawn drainage system, in which the drains or downspouts are directed to an underground storage well. The water filter slowly out of the well and eventually ends up in the groundwater tables.

❖ These surface drainage solution capture excess water in dry wells and catch basins having holes, filled with an aggregate like gravel that hold water and give it more time to soak in to the ground, the drain pipes are connected to the box drains and other systems to move the extra water



### 3. Herringbone Drainage

❖ Just like French ditch, the herringbone drainage is built on a slope. It consists of several trenches that are connected to the main drain, thus forming the structure called as herringbone pattern. This technique is best used on flooded lawns or gardens that are irregular in shape.

### 4. Corrugated Plastic Tubes

❖ These plastic tubes sit over the end of the downspout and can be buried underground to drain excess water within the landscape. These tubes are economical solutions for directing water from downspouts. This landscape drainage technique is more effective than other methods, it allows large volume of water to flow away from the landscape.

## 5. Create Bog garden/ Marsh garden



### Corrugated pipes

❖ Landscaping plants can be a great drainage solution for areas with a small amount of excess water. Many native plants in each region are well adapted to periodic bog conditions.

❖ Moisture loving, water loving plants like maple, fern, mint, herbaceous perennials that will grow in bog garden conditions specially care, watercress, Nepenthes, cannas lily, Iris, taro etc.

❖ If nothing else helps and water keeps emerging from the ground, so you can always option for a rain or bog garden.

❖ It is the area where the soil swampy and a shallow stream, due to which marsh garden can made at low lying site where surface drainage water will collect naturally in a sticky clay subsoil.



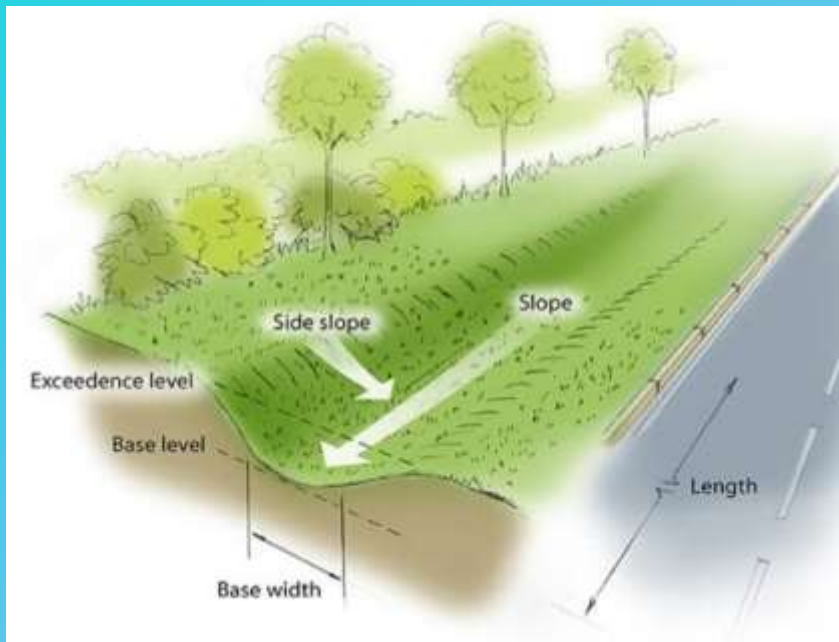
**Bog garden**

## 6. Grassy swale

- ❖ A swale is an area of the lawn which is carefully graded to direct water.
- ❖ It is a flat bottoms and lots of grass that helps rain runoff spread out and slow down sediment, other pollutants are filtered out as the water soaks into the ground grassy swale, have taller grass and need to be moved less often than normal turf areas.



**Grassy swale**



- ❖ A swale helps dissipate water over a larger area or directs the water to bog planting or towards the drain.
- ❖ A swale can be used in various ways depending on its size. A small swale can carry gutter/channel water from house to a dry well, while a substantial gutter/channel can be used to divert water from the base of a hill over a low lying house.
- ❖ Swale make ditches look like creek beds or small meadow.

## 7. Rain Barrels

❖ Rain barrels are a great way to deal with a trouble some downspouts that you are not able to extend. They collect water coming out of downspouts and store them for later use. We also connect rain barrels to a sprinkler system to water flower beds or part of our garden

❖ This way not only will you avoid flooding our garden, but also have an extra water supply to use during dryer months.

## Use Bark chipping



❖ Adding bark chippings to plant beds is a great way of dealing with poor draining soils. The bark will absorb moisture from the bed thereby improving drainage.

❖ These chippings are not only great at retaining moisture but also they prevent weed growth, it help insulate the beds during cold snaps and improve the aesthetic of any crop bed they are added to.

## 9. Build Raised Beds

❖ Building raised plant beds means you can fill them with good quality , free draining topsoil that gets your plants out of the boggy earth below, the size of the raised beds depends on the plant you want to grow, but the ideal size for vegetables raised beds is twelve to eighteen inches deep.

❖The bottom of a raised garden bed contain a layer of grass clippings, leaves, wood chips, straw and other organic material. The cardboard should be placed on top of that layer.

❖ The organic material will turn into compost, while the cardboard will prevent weeds.





- ❖ In most cases cedar is the best wood to use for garden beds because cedar is naturally rot resistant.
- ❖ Raised beds can be used to improve draining: soil is raised above the surrounding ground level.
- ❖ This can be disadvantage in droughts as more watering needed. Soil in raised beds is better drained so warms up faster in spring

## 10. Surface drainage system

- ❖ This type of drainage consists of ditches and flexible PVC pipes. They collect water from the ground level and divert them away and are usually suitable for areas with enough natural grade to allow water to drain away through gravity.



**Channel drain**



- ❖ A channel drain is used for surface water and is largely popular due to its simplicity in design and installation. It consists of a channel and are removable.
- ❖ It helps to deal heavy run-off caused by surface water and flooding.

❖ These surface and sub-surface systems are used to remove groundwater in situations where the soils aren't absorbing water quickly.

## Water wise Gardening

- ❖ Water-wise means xeriscaping, this term was coined by **Denver water** in 1970's.
- ❖ xeriscaping is a landscaping philosophy that uses as many native, drought-resistant plants as possible and arranges them in efficient, water-saving ways.
- ❖ Water-wise plants that evolved in regions with **lower precipitation** , thus requiring less water throughout the growing season than most residential landscape plants.
- ❖ This term used to describe a water and plant management practice that maintain or indicate plants that have lower supplemental water needs and grouping plants by water needs to encourage more efficient water use.
- ❖ How to save water while keeping our garden quenched and green by some techniques or tips.
- ❖ Install a water tank, rain barrels rather than wasting rainwater, to maximize roof runoff and redirect it for use on your garden.

❖ Save your cooking water, if you steam or boil vegetables, save the water rather than tipping it down the sink, it is full of nutrients and when cooled, makes a free fertilizer for watering your plants.

## 1. Choose plants carefully –

- ❖ Plant selection is most important part of the design process for most people and selecting the right plant for the right place is essential for creating a water-efficient landscape visit.
- ❖ For drought tolerant perennials, choose varieties that are native to your area. These plants will have adapted to your climate and soils.

## 2. Mulching

- ❖ It is an covering that protects soil from erosion and drying out. It takes many forms stones, bark, straw etc.
- ❖ Mulching is a layer of material applied to the surface of soil, for applying mulch conservation of soil moisture, improving fertility and health of the soil, reducing weed growth and enhancing the visual appeal of the area.



### 3. Container Planting

- ❖ Container gardening or pot gardening is the practice of growing plants, including edible plants, for this you can use metal, stone, concrete container.
- ❖ During summer, potted plants may need daily watering, you have used a healthy soil mixture that delivers adequate drainage while also holding in moisture. Frequency of watering depends on the kind of plant, potting medium, container size and weather conditions.
- ❖ In container less risk of soil-borne disease, no any weed problems, gives more control over moisture.



- ❖ Use large pots if possible, they require less watering, choose pots with drainage holes to prevent soggy overwatering, Place a container under pots to capture extra moisture.

- ❖ When planting, if manure, seaweed, composted yard, waste and other organic materials are added to healthier and more efficient at providing good amounts of soil nutrients. This healthy soil can then promote and reduced need for water in plants.



**Shade Garden**

#### **4. Made in the Shade (Shade garden)**

❖ Planting a shade garden with plants that prefer shade and don't need to much moisture. Planting small ornamental trees will also provide shade . In a vegetable garden, sowing a wall of sunflower can slow evaporation.

#### **5. Watering options**

❖ A longer, deeper watering is better to develop deeper roots that cope with dry spells than daily shallow watering.

❖ Switch from wasteful sprinklers to soaker hoses, drip tape and watering cans.

❖ Use tree watering bags to provide slow liquid release to roots, refill them every five to seven days.

❖ Use porous soaker hoses that allow small amounts of water to gradually seep into roots.