USING AUTOMATION CONTROL SYSTEM IN DRIP IRRIGATION AND MODERN MONITORING SYSTEMS AND EQUIPMENTS TO AMELIORATION OF DRIP IRRIGATION SYSTEM

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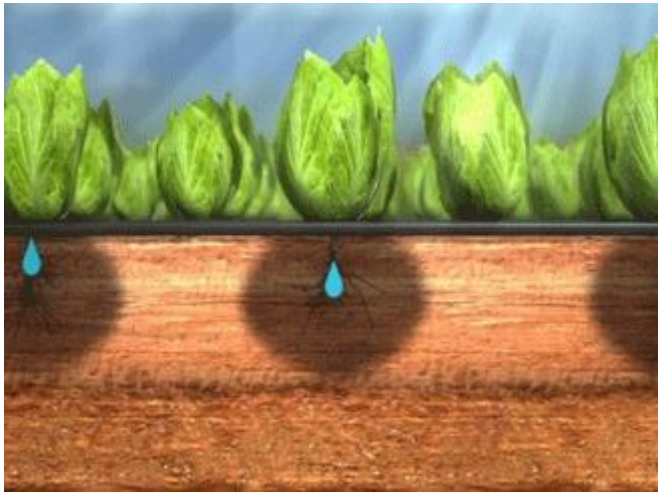


- Micro-irrigation technology is now widely accepted by most of the farmers in the world. Drip irrigation is the process which involves dripping water into the soil at very low rates (2-20 litres/hour) from a system of small diameter plastic pipes fitted with emitters or drippers. In this system water is applied close to the root of the plants which provides right amount of water required for the growth of the plant and avoids excessive wastage of water, unlike surface and flood irrigation, which wets the whole soil profile and sometime causes soil erosion and soil nutrient loss. With drip irrigation water applications are more frequent (usually every 1-3 days) than with other methods and this provides a very favorable high moisture level in the soil in which plants can flourish. Automation in drip irrigation means using all automated techniques such as solar power, microcontroller, sensors, remote control, embedded system etc. to irrigate the field conveniently sitting in one place. the efficacy of automated drip irrigation on water waste management in growing tomato crops were observed. Tomato crops are found to be sensitive to both water deficit and excess water. The average density of greenhouse tomato crops is 18000 plants/ha and the water requirements of tomato by drip irrigation attain 7000 m3/ha. It was found that computer based drip irrigation control could reduce water consumption by 20% to 30%.

How and Why?

- Drip irrigation is used for row crops, vegetables crops, flower but it is mainly used in greenhouses. In greenhouse it is very important to bring precise control which is needed for plant growth. The five most important parameters to consider when creating drip irrigation in greenhouse are humidity, temperature, ground water, carbon dioxide, light intensity. In addition to these some other equipment used are advance microcontroller, sensors, memory devices

How and Why?

- Automation in irrigation is required when it is inconvenient, if not impossible, to correctly irrigate without automation. For example, skilled labour may not be available to operate drip systems frequently and for short durations of time, which in many cases is the ideal to maximize yields and avoid wasting water and fertilizer. The problem worsens if valves need to be changed at some interval of time. Or in the case of cooling or propagation applications, it is difficult to train the labour completely to work with drip irrigation system. Thus automated drip irrigation system enables the grower to control the irrigation activity of the field by using controllers and valves which are cost effective and reliable

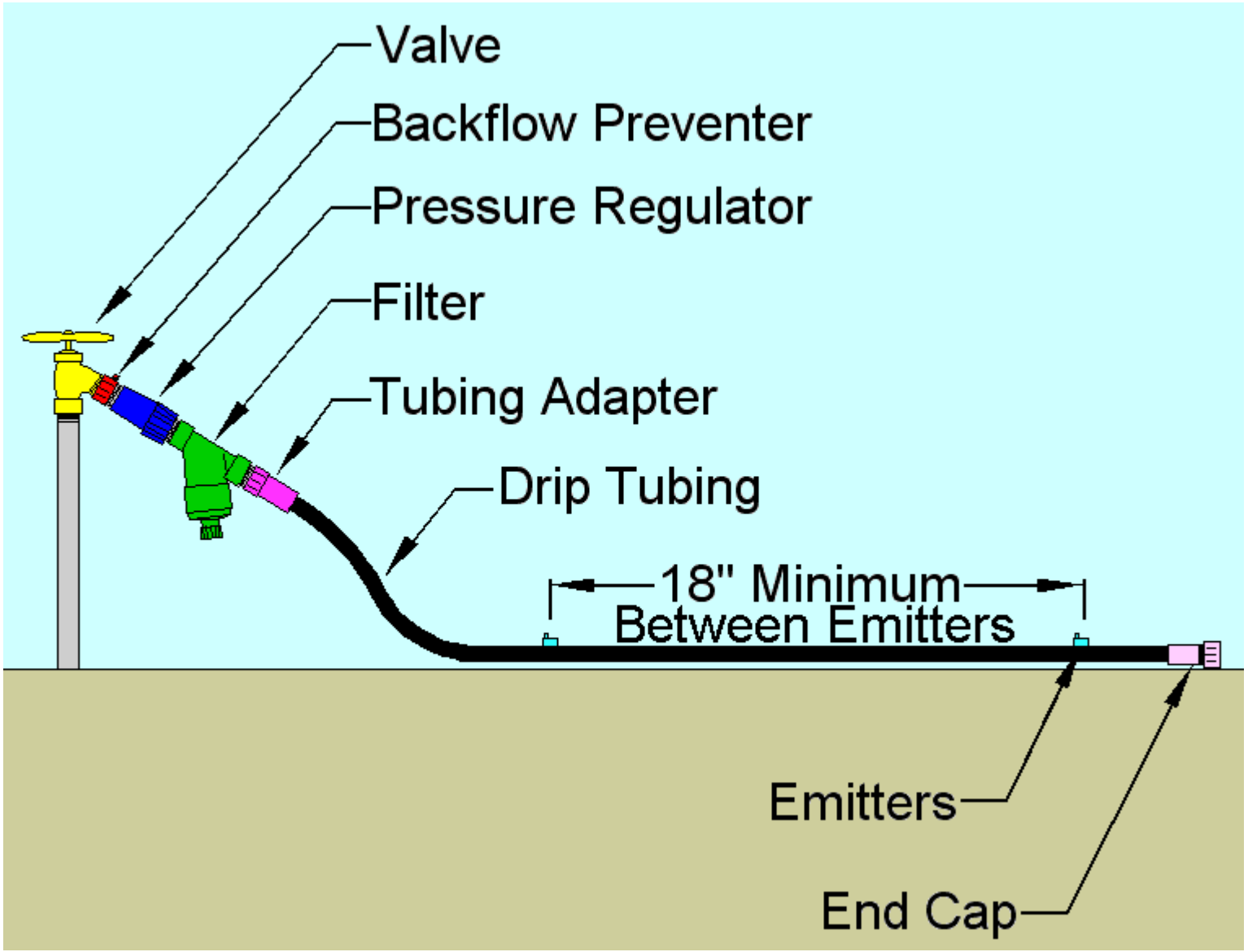
How do I know how long I need to irrigate?

Set out tuna cans or rain gauges
randomly throughout your lawn

Measure how much water
was applied and calculate how
long it will take to apply the water you need


(MLD-AAD) 1/2 GPH Add-A-Drippers w/ Coupler & Plug
(MLD-STA) Adjustable Dripper Stakes
(MLD-2PC2
Pressure Compensating 2 GPH Drippers (Bulk Pack 15)
Backflow Prevention Conector
(MLT-ATE) Assorted 1/4" Vinyl Tubing Connectors
(MLD-QDT100) 1/4" In Line Drip Tubing
(MLT-BXB) 1/4" Vinyl Couplers
Irrigation Clock/ Timer
Emitter
End Or Flush Cap
Pressure Regulator
Irrigation Filter

Drip System


Valve
Backflow Preventer
Pressure Regulator
Filter
Tubing Adapter
Drip Tubing
18" Minimum
Between Emitters
Emitters
End Cap

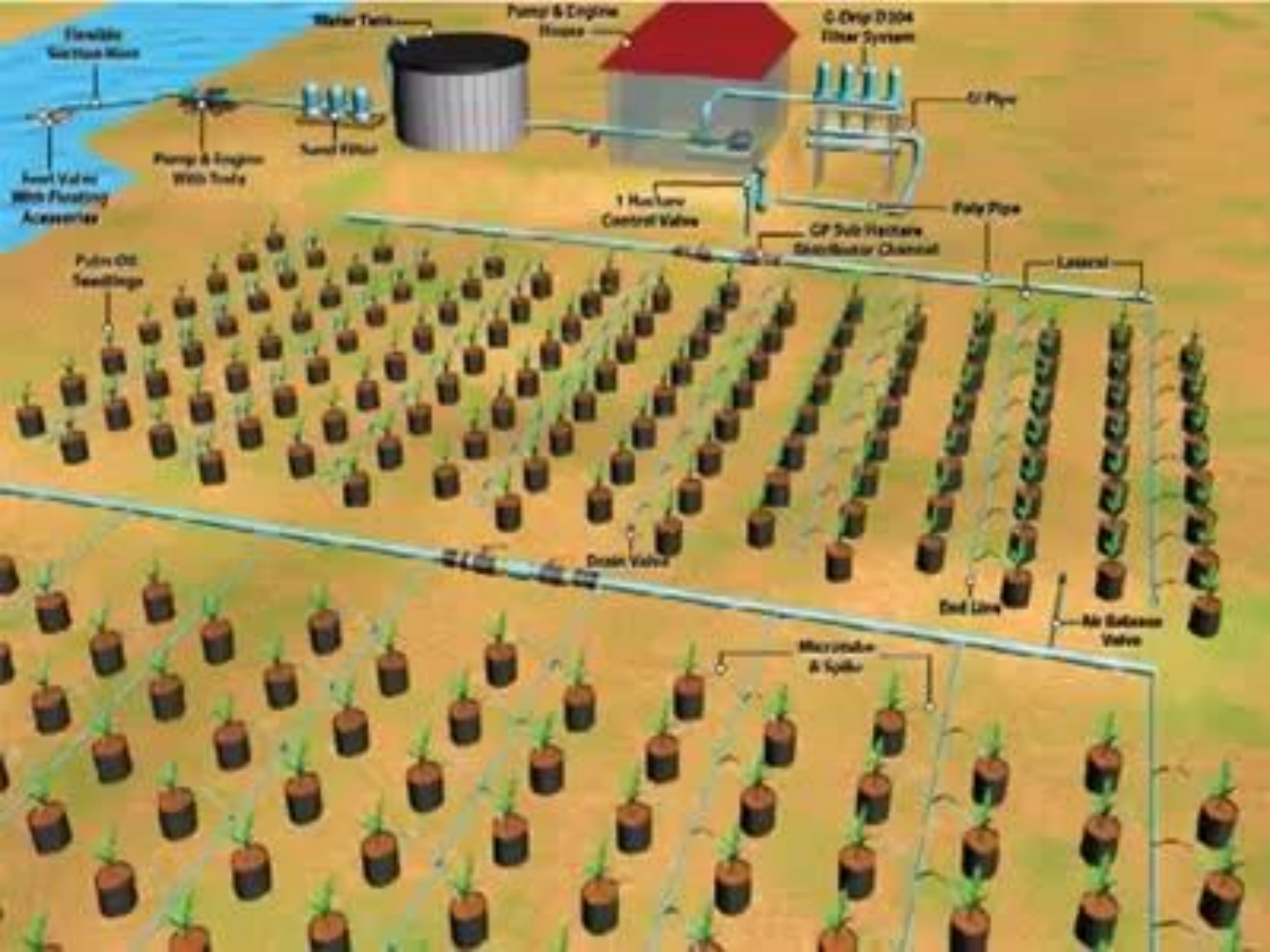
Rain Cutoff

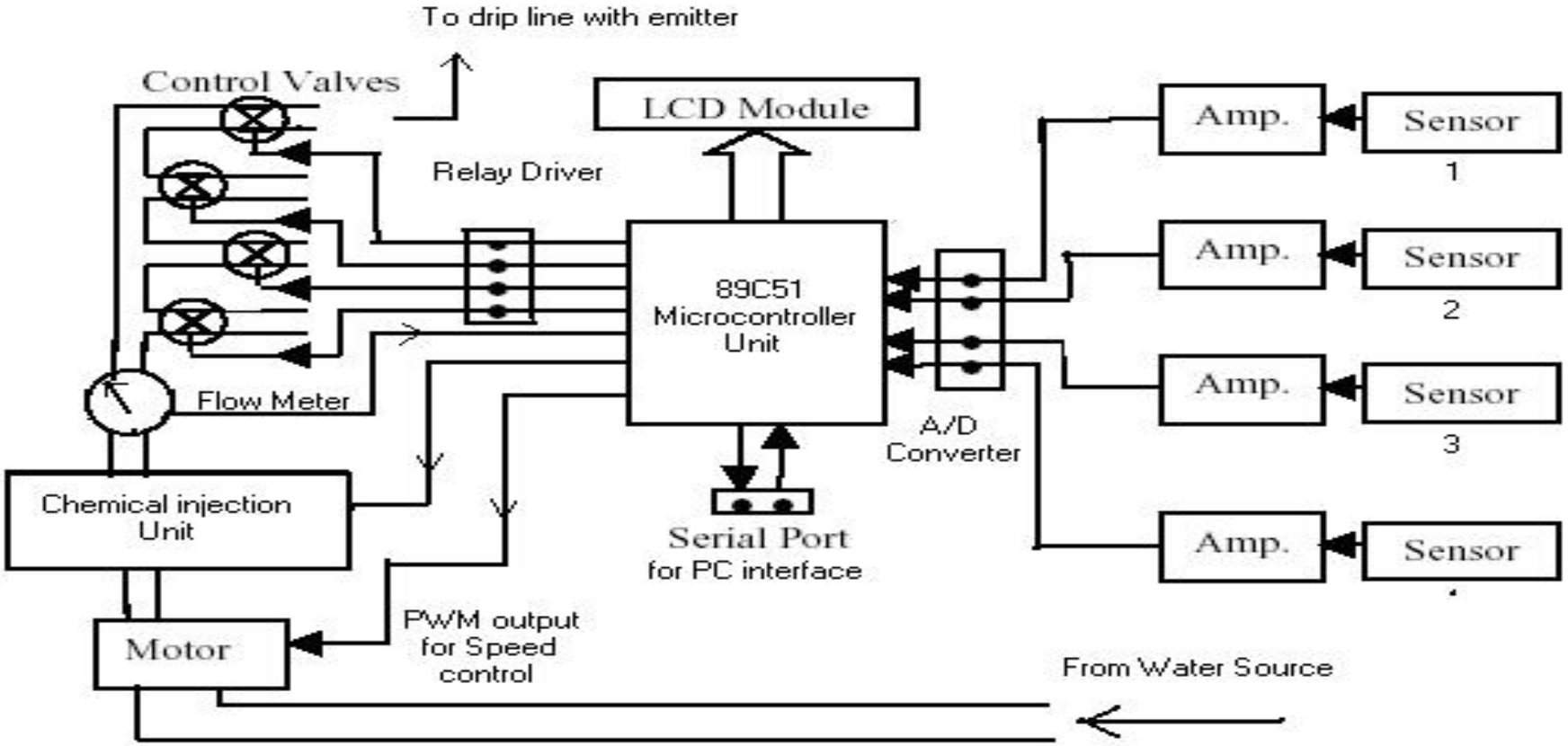
Install an automatic rain cutoff device

Don’t water in the rain!!!

Automatic Timer

- More difficult to set
- Automatically turns irrigation on
- Automatic shutoff


Water Tank
Pump & Engine House
Flexible Suction Hose
Foot Valve With Floating Accessories
Pump & Engine With Trolley
Sand Filter
G.I Pipe
1 Inch Gate Control Valve
Poly Pipe
Lateral
Palm Oil Seedlings
Drain Valve
End Line
Air Release Valve



Pic-2 automation control system of drip irrigation (scheme form)

Layout

Example:

300 mature plants (4 feet tall)

- Plant requirement – 4 gallons

- Total requirement: 300 x 4 = 1200 gallons

- Supply = 450 gallons per hour

Possible Solutions:

- One zone, ½ ghp emitters for 8 hours (150 gph)
- One zone, 1gph emitters for 4 hours (300 gph)
- Two zones 2 ghp emitters for 2 hours (300 gph)