

Venturi Injectors and Fertilizer Tanks

Venturi Injectors

A **Venturi injector** is a simple device that uses the **pressure difference** in a flowing irrigation pipeline to draw fertilizer or chemicals into the water stream.

Working Principle:

- Based on **Bernoulli's Principle**.
- As water flows through a narrow section of the injector (the Venturi throat), the velocity increases and pressure decreases.
- This pressure drop creates suction that pulls fertilizer from a tank into the irrigation water.

Advantages:

- Simple, no moving parts.
- Low cost and easy to install.
- Ideal for small to medium-sized farms.

Limitations:

- Requires a minimum flow rate and pressure differential to operate effectively.
- Less precise than more advanced fertigation systems.

Fertilizer Tanks

A **fertilizer tank** is a pressurized container attached to the irrigation system where fertilizers are pre-mixed and dissolved.

Working Principle:

- Fertilizer solution is added into the tank.
- As irrigation water passes through the tank, it picks up the fertilizer solution and carries it into the irrigation system.

Advantages:

- Simple to use and manage.
- Can handle larger volumes than Venturi injectors.
- Suitable for drip, sprinkler, and surface irrigation systems.

Limitations:

- Requires careful monitoring of concentration.

- Can lead to clogging if fertilizers are not fully dissolved.

References:

- Keller, J., & Bliesner, R. D. (1990). *Sprinkler and Trickle Irrigation*. Van Nostrand Reinhold.
- CE8603 - Irrigation Engineering, Anna University Lecture Notes.
- FAI Fertilizer Manual (2020), Fertilizer Association of India.