

Fertigation Infrastructure System

Structural designs for Controlled Environment Fertigation (CEF)

- A. **Dome:** Have concrete base footing; 4.2 m H; 6 m W ; 30 m long (L); 400-450 planting capacity. See Fig. 1.
- B. **Jack Roof:** Have concrete base footing; 4.3 m H; 6 m W 30 m L; 400-450 planting capacity. See Fig. 2.
- C. **Gable:** Have concrete base footing; 6.3 m H; 6.4 m W; 30 m L; 400-450 planting capacity. See fig. 3.



Figure 1. Dome

Figure 2. Jack Roof



Figure 3. Gable

CEF Cost Comparison

Types of Design	Cost (P/sq. m)	Cost (P/Unit) (6 m x 30 m)
A. Dome type	P1,300 - P1,400	P 234,000 - P 250,000
B. Gable	P1,400 - P1,500	P 250,000 - P 270,000
C. Roof Jet	P 1,500 - P1,600	P 250,000 - P 290,000

References:

- ifa fai newdelhi kalyan. pdf. Slide no. 17 <http://www.fertilizer.org/imis20/images/LibraryDownloads/2015>
- Training Course on Advanced Fertigation Technology To Increase Crop Production. Vivatel Hotel, Kuala Lumpur and Heritage Hotel Cameron Highlands, Pahang, Malaysia: Association of South East Asian Nations (ASEAN), Ministry of Agriculture, Forestry and Fisheries (MAFF), Jabatan Pertanian, May 22-June 4 2016.

Pictures: ghanaveg.org
 dir.indiamart.com
 www.indiamart.com
 www.auasia.com.my (Ipoh, Malaysia)
 www.freshplaza.it
 www.aua.gr (MACQU climate system)
<http://edoc.hu-berlin.de/>



Production Team

Developed by: Information Services Section
 Agricultural Training Institute - CAR

Writers & Layout: Lyra Fe M. Bobila, BSDC Intern
 Resley Ann G. Sumedca, Ag. I

Proofread & Edition: Randy T. Soriano, TS II
 Maximino R. Aromin Jr. IO III

For More Information, visit of call:



Department of Agriculture
 AGRICULTURAL TRAINING INSTITUTE
 CORDILLERA ADMINISTRATIVE REGION
 BSU Compound, La Trinidad, Benguet

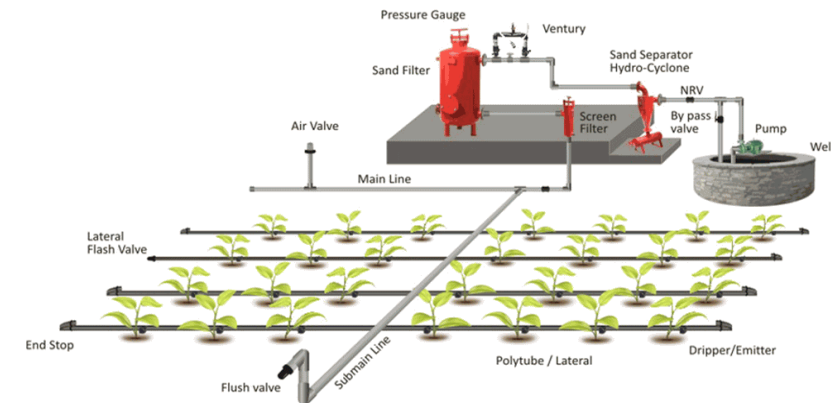
Website: www.ati.da.gov.ph/car

Telephone Numbers:

Administrative Services : (074) 422-2375
 Technical Services : (074) 309-2093
 Tele-Fax Number : (074) 422-7460
 E-mail address : ati_car@yahoo.com

Fertigation

Fertilizer + Irrigation



“Spoon feeding” approach of fertilization

What is fertigation?

Fertigation is the application of nutrients through irrigation systems, a contraction of fertilization and irrigation to supply the plant with its daily demand of water and nutrients/fertilizers as required by its specific growth stage throughout its development.

It is usually practiced on high-value crops such as vegetables, turf, fruit trees and ornamentals.

The units of fertilizer application are calculated based on the fertilizer requirement of individual plant. This is expressed in units of milligram (Nitrogen, Phosphorus or Potassium) per day over the entire growing period.

Fertigation vs. Conventional Fertilization (CF)

FERTIGATION	CF
<ul style="list-style-type: none"> Fertilizers applied with the water 	<ul style="list-style-type: none"> Fertilizers applied separately from the water
<ul style="list-style-type: none"> Nutrients are dissolved and taken up in the root zone 	<ul style="list-style-type: none"> Nutrients are not dissolved in the dry zones where the soil is not wetted
<ul style="list-style-type: none"> High fertilization efficiency 	<ul style="list-style-type: none"> Low fertilization
<ul style="list-style-type: none"> Preferred method to correctly apply fertilizers to irrigated crops 	<ul style="list-style-type: none"> The benefits of Micro Irrigation System (MIS) are not expressed

Types of Fertigation

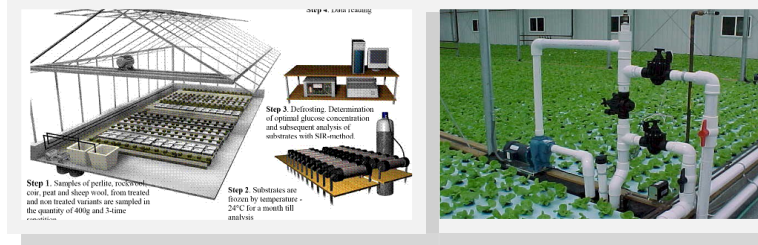
Hanging Open Fertigation

- ⇒ This technique is suitable for problematic areas such as acidic soils condition, peat soils, ex-tin mining area, bris soils and those areas subjected to flash flood.
- ⇒ Able to reduce attack of soil borne diseases, damage due to flash flood and longer crop harvesting period compare to the conventional method.

Hanging Open Fertigation



Controlled Environment Fertigation (CEF)

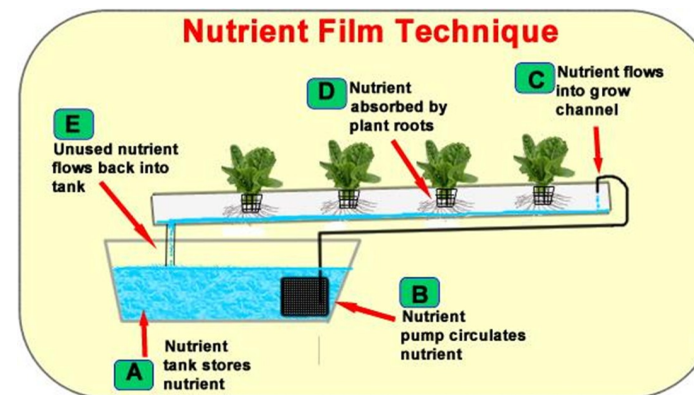


Fertigation with Rain Shelter



Nutrient Film Technique

- ⇒ Very shallow stream of water containing all the dissolved nutrients required for plant growth is re-circulated by a pump past the bare roots of plants in a watertight gully. The unused nutrients flow back into the tank for growing plants.



Benefits of Fertigation

More Efficient Use of Nutrients	Nutrient use efficiency by crops is greater under fertigation compared to conventional application of fertilizers to the soil
Less Water Pollution	Fertigation helps lessen pollution of water bodies through the leaching of nutrients such as N and potassium (N) out of agricultural farming
High Resource Conservation	Fertigation helps in saving of water, nutrients, energy, labor and time
More Flexibility in Farm Operations	Fertigation provides flexibility in field operations. E.g. nutrients can be applied to the soil when crop or soil conditions prohibit entry into the field with conventional equipment
Efficient Delivery of Micronutrients	Fertigation provides opportunity for efficient use of compound and ready-mix nutrient solutions containing small concentrations of micronutrients
Healthy Crop Growth	When fertigation is applied through the drip irrigation system, crop foliage can be kept dry thus avoiding leaf burn and delaying the development of plant pathogens
Effective Weed Management	Fertigation help reduce weed menace particularly between the crop rows. Use of plastic much along with fertigation through drip system allows effective weed control in widely space crops
Effective Use of Undulating Soils	The ability of micro-irrigation system to irrigate undulating soils makes it possible to bring such land under cultivation, which otherwise remains as wastelands or used as pasturelands
Reduce Soil Compaction	In mico-irrigation system reduced need for surface traffic movement during irrigation and nutrient application helps to reduce soil compaction

System Components

Suction Segment

- Water Source
- Pump
- Filter
- Fertilizer mixture/injector
- Control panel/timer
- Control valve

Delivery Segment

- Piping system
- Control valve
- Nozzle