

Contemporary Cultivation of Hydroponic Medicinal Plants

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Abstract- Hydroponics is the significant method to grow of plants in which water is mixed with nutrients and used in cultivation of many medicinal plants and crops without losing its originality of medicinal value. This method is done by various western countries. This method decreases the necessity on forests. Hydroponics method is a reliable method for many problems such as increased population, improper agricultural practices, global warming, climatic change due to excessive use of insecticides, pesticides and various types of fertilizers are used, they help to decrease the fertility of soil as well as lead to the scarcity of water. The hydroponic method is premediated to make the cost effective system and a better yield of medicinal plants. These plants are *Ocimum basilicum L.*, *Marigold*, *Eclipta prostratas*, *Andrographi spaniculata*, *Salvia officinalis L.* *Mentha piperita L.* They help us to increase the polysaccharide level, flavonoid level, tannin level and extractive substances are recorded in hydroponics conditions. In this Review article we study to increase the planting system, natural media of hydroponic system and increase the demand of food and medicinal plants.

Keywords: Hydroponics system, Productivity, Medicinal plants, Natural media.

I. INTRODUCTION

Hydroponic System is the contemporary system of biotechnological method that is suitable for crop plants and medicinal plants. This method is pragmatic method for land poor and water poor countries. There is the conception of hydroponicum system to the development of peculiar and economical system to surge the expertise of plants in this system. It is very low in cost system (Mirpetyn SK etal. 2007).

The word Hydroponic is a Greek word "Hydro " means water and "Ponos" means labor. The first practice was done on lettuce, tomatoes to make more product yield are obtained, soil borne diseases can be eliminated and usage of chemical pesticides and fertilizers can be prevented, water scarcity can be overcome, There is no need for larger space for cultivation, Plants will get balanced supply of air, water and nutrients(Sonneveld C.,2000).

Water stream hydroponics is based on nutrient solutions that are jet type directly to the root bearing labum by providing the air-water-nutrition tenure required for the normal growth and the development of plant preclude the environmental pollution to minimize the danger of diseases such as bursts, spread of pests and weeds. There are different methods of hydroponics that is Wick, Water culture, Ebb and flow method, Deep Water culture, Nutrient Film Technique method and Aeroponics method.

III. CROPS GROWN IN HYDROPONIC SYSTEM

Rice and Maize are the cereals grown in Hydroponics system. In Fruits Strawberry is mostly grown. Tomato, Chilli, Brinjal, Green beans, Winged beans, Bell pepper, Cabbage, Cauliflower, Cucumbers, Melons, Radish, Onions, Lettuce, Parsley, Mint, Sweet basil, Oregano, Marigold, Roses, Carnations, Chrysanthemum, Indian Aloe, Coleus, Sorghum, Alfa Alfa, Barley, Bermuda grass, Carpet Grass(Savvas D 2002, De Kreij C etal.,1999).

III. CLASSIFICATION OF HYDROPONIC TECHNIQUES

a) Wick Culture:- It is also called capillary action method. These pots are shallow set up in shallow in compartment that has latent medium by fine activity. Air circulation is significant. This strategy is appropriate for decorative purposes, for blooming purposes and indoor plantation (Anonymous. 2013).

b) Water Culture: - It is also called as Nutrient Film Technique. In this technique plant is regularly reinforced in a little plastic bushel with the help of roots in the supplement arrangements. This channel is made up of malleable sheet. This technique help in development of root structure entwined with the channels (Resh and Howard. 2004).

c) Deep flow technique: - That technique is also called pipe system. The PVC Channels might be arranged with the streams of channels. The criss crossed framework is used that

is made up of PVC pipes. The little cups are also used on the openings on the sides of pots (Hydroponics Guide).

d) Ebb and flow method: - This technique is a combination of shallow irrigation technique from NFT and DFT for root strengthening qualities. It is very ease and low cost method. Many veggies are grown such as tomatoes, cherries and beefsteak, lettuce, cucumbers and their many varieties are grown.

e) Aeroponics: - Aeroponics is a scenario for developing the plants in gaps. The aeroponics culture is normally drilled in secured structure for low flourishing veggies like spinach, lettuce. In this technique gives high yield and less space requirements. It consume more oxygen equals more plant growth. It helps to reduce the water usage by 98%. Their plants are potentially healthier and nutritious (Gagan K., 2014).

IV. HYDROPONIC NUTRIENTS

There is many nutrients are used such as Potassium nitrate is used that has Nitrogen and Potassium content. It is more soluble with salts. It also contains Potassium phosphate monobasic that contains the content of Potassium and Phosphorous. Magnesium sulfate contains the content of sulphur and magnesium. It is a type of pure salt that is highly soluble and cheap in cost. Next is Iron chelate .It is the best source of iron. Another one is boric acid; it contains Boron that is the best source of Boron. Calcium nitrate contains Nitrogen and calcium that is a soluble salt (Ellis NK etal., 1974).

V. FORMULATIONS OF NATURAL MEDIA FOR HYDROPONICS

a) Vegetable fruits waste Extract:-They have rich sources of phytochemicals for the extraction of phenolic compounds, dietary fibres and other bioactive compounds as well as essential nutrients lie in seeds, peels & other components of fruits and vegetables are not consumed (Rudra etal., 2015).Similarly the peels of lemons, grapes and oranges, avocados, Jackfruits and mangoes has 15% higher phenolic concentrations (Gorinstein., 2001a; Soong and Barlow etal., 2004). It is kept in dark room & incubates in 20 days when carbon dioxide is formed. This solution is acidic in nature when it is mixed in proper ratio that is 1:10 in which 10ml solution and 90ml solution is water that is used in hydroponic solution.

b) Vermicompost Extract:-

Earthworm burrowing improves aeration and water infiltration of soil. Its mucus secretion is made up of mucoprotein and rich in carbon. Its urine secretion contains ammonium and Urea (Scheu. 1995).Water is passed out to obtain the extract to get a solution is concentrated. It gives higher yield of solution.

VI. DEMAND TO INCREASE THE MEDICINAL PLANTS

*Mentha piperita*L.,*Ocimum basilicum* L., Marigold and *Salvia officinalis* L. are the essential oil-bearing medicinal plants used for the treatment of cardiovascular, gastrointestinal tract, liver, Gallbladder's disease, atherosclerosis. Asthma, gum bleeding and other diseases as well as antioxidant activity (Mairapety SK etal., 2007, 2013, 1989; Lavrenov VK etal., 1999).

Some herbs have polysaccharides, vitamin C, Tannins and used as blood regenerating, sedative and antiinflammatory agents to decrease the blood pressure (Lavrenov VK., 1999).

Similarly Chives, Basil, Mints are the herbs grown in hydroponics solution. In fruits strawberries, blueberries are mostly grown in hydroponics method.

VII. CONCLUSION

Hydroponics is used as natural manner without artificially chemicals are added. In our present study we grow many medicinal herbs that are used in many purposes in human being's life. Hydroponics culture is fast up energy for developing area of farming and agriculture. Various fruits and vegetables are grown fastly in different parts of world with different systems and medias of hydroponics.