

Drip irrigation for coconut in Kerala

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Though Kerala is known as the land of coconuts, the production and productivity of palm is low compared to other coconut growing states, particularly Tamil Nadu and Karnataka. Several reasons are attributed to the low productivity of the crop in the state. Rain fed nature of the crop with low adoption of irrigation practices, low fertility status of the soil due to continuous cultivation of this crop without regular application of manures and incidence of diseases are the major reasons attributed to this. Coconut gardens in Kerala are subjected to drought in summer months in every year due to climate change. Even though farmers were aware that coconut palms respond well to irrigation during summer months, they are not taking up irrigation. In Kerala, only less than 10% of the total area is under irrigated condition, whereas in Tamilnadu and Andhra Pradesh it is purely an irrigated crop. However there is a trend growing among the coconut growers of Kerala to start irrigation in areas where sufficient water is available in summer months.

One of the major reasons for the low adoption of irrigation in coconut gardens is lack of availability of sufficient quantity of water during summer months. Since most of the farmers are not aware of the modern techniques in irrigation they follow traditional surface irrigation methods and thus a large quantity of water is wasted. Besides, irrigation through conventional methods is laborious.

Drip irrigation technology is the ladder of modern irrigation and is a shift from the conventional wasteful system of irrigation. Studies conducted at Centre for Water Resource Development and Management (CWRDM), Kozhikode and Central Plantation Crop Research Institute (CPCRI), Kerala showed that this method of irrigation is highly suitable for plantation crops, especially coconut, which is extensively cultivated in the state. Adoption of this system of irrigation is an option for efficient use of water and nutrients for improvement in the productivity of this crop.

Drip irrigation in coconut gardens

Drip irrigation is the frequent slow application of water to the soil at the plant root-zone through a series of entry points in the delivery line. It is the process intended to deliver water at the active root zone of coconut palm in quantities approaching its evapotranspiration requirements and at a rate close to what the soil will absorb. The objective is to maintain the moisture content of the soil close to field capacity so that roots will have constant supply of water.



For coconut, generally, three to four drippers are given per palm. Open four pits of size of 30 x 30 x 30 cm opposite to each other at one meter distance from the trunk. Place 40 cm long PVC pipe (16 mm) in a slanting position in each pit and place the drippers inside the tube and allow the water to drip 30 cm below the soil surface. Fill the pits with coir pith to prevent evaporation. The cost of drip system including installation will be Rs. 130 to 150 per palm (exclusive of pump) which works out to Rs. 23000 to 26000/- approximately per hectare of coconut garden with four emitter per palm.

Fertigation: Fertilizers also can be applied through drip system. Application of 50% of the recommended dose of fertilizer through drip fertigation produces a yield equivalent to 100% of the recommended dose of fertilizer applied through conventional methods. The fertilizers are applied through bypass tank to the palms. 70g Urea, 60g DAP and 170g Murate of potash are recommended for single dose per palm. Similarly six doses are to be given to the palms which are to be applied from December – May at monthly intervals for Kerala condition. For phosphorus application commercial phosphoric acid can also be used.

Advantages of Drip irrigation

Adoption of drip irrigation along with application of fertilizers (fertigation) increases productivity of coconut, besides ensuring higher efficiency of water and nutrients in coconut. In drip irrigation system use of 30 to 50% less water is required than conventional methods. Labour and fuel are also saved by adopting this method. It is suitable on undulating lands, weeds can be controlled and fertilizer efficiency can be increased due to localized application and reduced leaching. Drip irrigation is highly suitable to sandy tracts and there will be low incidence of pest & disease.

Disadvantages of Drip irrigation

Drip irrigation is susceptible to clogging problems. It is economically viable for only widely spaced crops

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Results of PER

Table – IV Mean scores of PER

Group	Average protein intake	Average total weight gain	PER
Control	40.65	139.62	3.43
Group 1	39.08	123.5	3.15
Group 2	37.45	107.5	2.86
Group 3	34.5	109.5	3.17
Group 4	32.35	108.37	3.34

Rats of control group (Table-IV) showed the highest protein intake followed by the rats of Group 1. The protein intake was the least in Group 4, yet the PER value was only marginally lower than control. This shows the high quality of protein in the formulated food that has helped in the growth and development of rats of Group 4. The PER of Group 4 which was fed with 100% of coconut milk powder was the highest (3.34) among the experimental groups. This indicates that the incorporation of coconut milk powder at 100% level had

promoted substantial growth. This also confirms that coconut milk powder can be added to the health mix of children as it has such enormous growth potential.

Conclusion

Health mix prepared with coconut milk powder is a power packed supplement which is good for health. The proteins present in coconut will promote the growth of the growing children to attain their growth for age. The formulated health mixes are a combination of conventional foods and no artificial additives or supplements have been added to enhance its nutritional quality. The health mixes thus prepared with coconut milk powder can be promoted as a nutritious health drink for children.

Reference

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and for high value crops. High level of management is needed and drip irrigation is suitable in arid/ drought hit areas where sufficient water is not available in summer months for irrigation.

Drip feasibility in coconut gardens of Kerala

Field level observations reveal that drip system of irrigation has not become popular among coconut farmers in Kerala. A careful consideration of the drip irrigation and nature of coconut gardens in Kerala show that the advantages of drip irrigation can be well utilised and its disadvantages can be minimised by the selective adoption of this system of irrigation in chosen areas. The major justifications for adoption of drip irrigation in coconut gardens of Kerala are briefed below:

The coconut palms of Kerala during every year faces moisture stress from November to May and respond well to irrigation during this period. Spacing of this crop is wide enough to make the cost of the system to be lowest. Since it is a cash crop additional return can pay back the system cost quickly. The labour cost is high in the state. The saving in labour costs will be an added incentive. Generally, soils of Kerala are highly infiltrative and the surface system will waste water. Drip can avoid this. In coastal areas saline water can be effectively used for irrigation through drip system since salt accumulation near root zone is prevented by the continuous application of water near root zone through drip. In most of homestead farms irrigation is well-based where the quality of water ensures less clogging. More homestead farms in existence are with intensive cropping systems. So the intercrops also can be irrigated. With the fragmentation of holdings, part time cultivators are more in the state. They can well adopt such labour saving irrigation system. Certain areas of the state like Kollam, Pathanamthitta and Palakkad districts can very well adopt this system as water is very scarce there.

There is ample scope for wide adoption of this system of irrigation in coconut gardens of Kerala. Institutional agencies finance drip irrigation especially in areas of scanty rainfall and water scarcity. The Government of India has been implementing centrally sponsored scheme through the state government promoting adoption of micro irrigation with the objective to enhance water use efficiency in agriculture section by promoting appropriate technology interventions like drip irrigation technology thereby encouraging farmers for adoption by extending financial and technical support. It is necessary to educate the coconut growers on the viability of drip irrigation system and motivate them to adopt the same in their coconut gardens. However, today, many progressive farmers have shown keen interest and are adopting drip irrigation system in their coconut gardens. Large scale adoption of this technology will make a break through in the production of coconut in the state.