



Centre Pivot Irrigation System

People in various parts of Eastern Africa have been suffering from drought with worst hit region being North Eastern Kenya. Unfortunately most of the farming in EA depends on cyclical rain which is anecdotal. Irrigation especially centre pivot irrigation for arid areas would go a great length to assist in food production even for export purposes.

A good example of an organization that is using centre pivot irrigation, modern farming techniques including use of tractors for leveling, weeding and spraying is Rift valley Vegetables Ltd (RVV 1), one of East African Growers farms. In their land at Naivasha which is approximately 250 ha, they are able to plant 7 ha of French beans, 2 ha of garden peas, 2 ha of baby corn and 2 ha cabbages per week in addition to other Asian Vegetables using modern farming equipment.

According to Mr. Logan, they have 4 running central pivot systems; 400m – 450m in length, and they are completing on the fifth one. “We are able to irrigate large areas, the pivots covers 168 acres, 125 acres, 172acres,75acres,35acres respectively and we have drilled water wells to serve each pivot” Said Logan. Crops are planted in straight rows forming pie chart;

conforming to the travel of the center pivot which is driven by an electric motor mounted at each tower.

The planting programme is dictated by the market all year round. “We plough the ground till it is fine, we make raised beds for improved drainage and to avoid plant roots suffocation resulting from excessive moisture levels, and then we sow the seeds. All these operations are mechanized” Mr. Anthony Muiruri (Group Agronomist) narrated to Hortfresh crew.

“For French beans depending on the weather they germinate after two weeks, they take 8 weeks to come into production which is approximately 55-60days. The first weeding is done before seeds germinate by use of herbicide to kill dormant weeds seeds in the soil, 3rd week after germination mechanical weeding is done while on 7th week final manual weeding is done since the crops are maturing and the big canopy may be damaged by mechanical weeder” elaborated Mr. Anthony on how they grow French beans.

Center pivot irrigation is a method of crop irrigation in which equipment rotates around a pivot irrigating a circular area to the pivot, creating circular patterns in crops when viewed from above.

It is a form of overhead irrigation consisting of several segments of pipe; usually galvanized steel or aluminium, joined together and supported by trusses, mounted on wheeled towers with sprinklers positioned along its length.

The machine moves in a circular pattern and is fed with water from the pivot point at the center of the circle. The outside set of wheels sets the master pace for the rotation. The inner sets of wheels are mounted at hubs between two segments and use angle sensors to detect when the bend at the joint exceeds a certain threshold, and thus the wheels rotates keeping the segments aligned. To achieve uniform application, center pivots require a continuously variable emitter flow rate across the radius of the machine. Nozzle sizes are smallest at the inner spans to achieve low flow rates and increase with distance from the pivot point.


Concerning the system Mr. Nicholas Ambanya, General Manager East Africa Growers said that it is economical cheap and also long lasting. “Comparing other overhead irrigation methods, it is cheap to produce crops such as baby corn, onions and cabbages. We are able to grow 4000 cabbages per month all year round with low cost of production”, he said.

Centre pivot irrigation is the best method of irrigating large areas. It is the cheapest way of irrigating on a large scale since it requires less labour- one pivot is handled by one person. According to Logan they are able to irrigate 150 acres in two days. It offers accurate water distribution at low pressure. No blockages as compared to drip irrigation. Pests are washed out hence low use of chemicals.

Though establishment cost is slightly higher than drip system, centre pivot has 20 years lifespan with low maintenance, basically requiring routine checks such as making sure there aren't any leaking oil-seals on the drive units, the pressure of the wheels is correct, air vents on the gearboxes are open and that tower drain valves are kept clean. Centre pivot gear box oil is drained and replaced preferably once a year. The rest of the system is electrical requiring less maintenance.

For centre pivot to be used the terrain needs to be reasonably flat and uses takes more water; but one major advantage of the system over alternative systems is the ability to function in






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undulating country. This advantage has resulted in increased irrigated acreage and water use.

By using water wells, centre pivot and modern equipment, production will be consistent and people of Eastern Africa will suffer hunger no more. Given the precise application of water, low maintenance and labour costs, the system is viable for arid areas. "This can happen with same bore holes as those already sank, and since people in these areas are not accustomed to farming lifestyle, mechanisation should be used for the other operations. We had the same challenge at our Rumuruti farm but by use of centre pivot and tractors for weeding we were able to overcome the challenge", Nicholas concluded.