



## Success story on Tractor operated Trench Cutting Machine under RKVY /NADP

Micro Irrigation Systems are being installed in the farmer's field to improve the on-farm water use efficiency and to reduce wastage of irrigation water. Installation of drip Irrigation systems with main and sub-main pipelines require excavation of trenches. These trenches should be dug within the specified time to avoid delay in installation of drip irrigation system. During COVID 19 lockdown period, farmers faced huge labour problem for agricultural operations and formation of trenches for the pipe lines. The Tractor operated Trench cutting machine could be used for digging the trenches in time to avoid wastage of time and also to meet out the scarcity of labour.

Agricultural Engineering Department (AED) has purchased 28 Nos. of Tractor operated Trench cutting machine (TCM) at a unit cost of Rs.5.43 lakh amounting to a total value of Rs.1.52 crore during the year 2019 – 20 under National Agriculture Development Programme (NADP) for the AED owned Tractors in order to hire out the same to the needy farmers for trench cutting purpose.



**Tractor operated Trench Cutting Machine**



**Feed back from Thiru.Devaraj (Mobile: 9150319757), Farm Manager, M/s. Vasavi farms, Iruttuppallam, Thondamuthur Block. Coimbatore.**

M/s.Vasavi farms hired Tractor operated Trench cutting machine attached to the tractor of Agricultural Engineering Department, Coimbatore Sub Division to install water conveyance pipelines for drip irrigation and cables for power distribution in the farm.

The Tractor operated Trench cutting machine was engaged for excavating trenches for a total length of 850 m in 50 hours of operation.

The farm manager felt that the Tractor operated Trench cutting machine is very convenient, comfortable and economical for trench cutting operation when compared to manual excavation and using bigger machineries like JCB.



**Advantages of Tractor operated Trench cutting machine**

The advantages highlighted by the Manager of M/s.Vasavi farms, Coimbatore are;

❖ Time saving

AED's Tractor operated Trench cutting machine was able to dig out 850 metre length of 1.5 ft x 1.5 ft trenches, within 50 hours of operation, over a period of 8 days. However, the same could have required 80 man days (4 skilled labourers working for 20 days). Compared to manual labour, 60% of time can be saved with the usage of Tractor operated Trench cutting machine.

On an average, 15 to 25 metre long trenches could be excavated per hour with Tractor operated Trench cutting machine, whereas only half the length could be excavated with manual labour at the same time. Within one day of 8 hours, a Tractor operated Trench cutting machine can form 90 metre to 120 metre long trench depending on the hardness of the soil, wet condition and number of operators.





## ❖ Economics

The Tractor operated Trench cutting machine hired from AED is very economical and charges Rs.340 per hour or Rs.2720 per day of 8 hours and the output is 120 metre long trench. It works out to Rs.23 per metre. (Rs.340 per hour x 8 hours / 120 metre)

At the same time, manual labourers work efficiently only for 6 hours over a duty period of 8 hours per day and excavate only 40 – 50 metre trench in that period. Minimum 3 skilled labours are to be engaged for digging, spading and lifting the excavated earth and their wage per day is Rs.600 to Rs.800 per head. The average cost per metre works out to Rs.47 per metre (Rs.700 per labour x 3 Nos. / 45 m).



Therefore, the cost of excavation with AED's Tractor operated Trench cutting machine works out to half the cost of excavation with manual labour.

## ❖ Uncertainty in Labour availability

During the COVID 19 period, availability of skilled labour is scarce for excavation works. Further their continuity till the completion of trenching work is also uncertain as the rate of work output is slow compared to Tractor operated Trench cutting machine.

## ❖ Quality of work

The trenches made by Tractor operated Trench cutting machine are uniform in their cross section and alignment over a long range. The hydraulic power of Tractor operated Trench cutting machine is capable of dislodging the hard sub strata, soft to medium rocks therein and provide a leveled surface for laying pipes. With manual labour, such a leveled surface is very difficult to obtain, especially wherever hard / dry strata is encountered and this require corrections at extra cost. Uniformity of the Tractor operated Trench cutting machine excavated trenches enables simultaneous laying of pipe lines without additional time and cost on trench corrections.





### ❖ Closing of Trenches

Since the Tractor operated Trench cutting machine has shovel attachment at the front, the excavated trenches are filled up with earth and compacted uniformly within short time, after laying pipes whereas additional man days are required for trench filling and leveling.

### ❖ Damage to existing underground installation

Because of high sensitivity of hydraulic unit of Tractor operated Trench cutting machine and proximity to the point of excavation, the operator could avoid damages to underground cable lines when compared to trenching by bigger machines like JCBs.

### ❖ Outcome

The farmers engaging the AED's Trench cutting machine are preferring it over the manual workers for trench excavation and are satisfied with the performance of the machine for timeliness, quality and cost economics. Other than trench cutting, these machines are also used by the farmers for land leveling and bund formation. During the COVID 19 period in the year 2020-21, the Tractor operated Trench cutting machine have worked for about 20,680 hours in the farmers field for the benefit of farming community.

