

Zero/Minimum Tillage Technology in Sugarcane-A Success Story of Innovative Farmer

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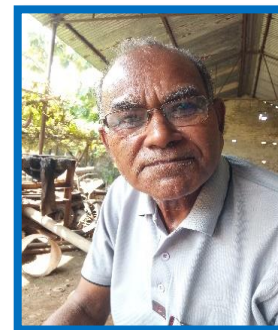
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Name and description of the farm/ enterprise:

Sugarcane cultivation through zero/minimum tillage technology is being adopted by **Mr. Vinay Kumar Pandey**, village-Badnihar, block-Narkatiaganj, West Champaran. Sugarcane is a clonally propagated crop with the planting of sugarcane setts traditionally. In this traditional method, the issues like the requirement of high seed cane, low germination rate, difficulty in seed treatment, fertilizer application, etc. are affecting the cost of cultivation as well as sugarcane production. Doubling of farmers' income, the flagship program of the present government can be achieved by increasing productivity and reducing the cost of cultivation. Planting of sugarcane by modified/developed zero/minimum tillage sugarcane cutter planting machine with trench opener & sub-soiler can save seed cane requirement up to 30-35 percent. It is less expensive and labor-saving in comparison with conventional sett planting. This method also reduces the water requirement of the crop and reduces plant protection costs.



The methodology adopted by the farmer:

He has modified/developed zero/minimum tillage sugarcane cutter planting machine with trench opener & sub-soiler, electric power sugarcane bud cutter, hand sugarcane bud cutter, sugarcane power take-off weeder- tractor operated, power take-off the generator for irrigation- tractor operated-3-4 tube well at a time, sugarcane leaf destresser, modified boom sprayer-tractor operated, modified knapsack sprayer and a modified tractor-mounted aero tiller to use the mixing of waste material for proper decomposition. They are using these modified implements in their sugarcane cultivation and also using them as custom hiring in nearby areas.



Economic impact:

He is using zero/minimum tillage (25% Tillage) sugarcane cutter planter with trench opener & sub-soiler machine in their sugarcane cultivation. He is reducing the total cost of sugarcane cultivation by 28-32% and reducing only sowing costs by 55%. Sub-soiler and rotary attachment help break the hard layer of soil and plant sugarcane at proper depth (20-25 cm) and width (45 cm). He is using an electric power sugarcane bud cutter/occasionally hand-operated bud cutter for cutting off buds from cane and reducing the cost of bud removal, labor, and time-saving. Tractor-driven sugarcane power take-off weeder is used for removal of weeds with roots in less time. PTO. (Power Take-off) – tractor-driven generator is used to operate at a time 3-4 tube wells simultaneously for irrigation in the area of Gandak basin (within 1-kilometer radius). This technique saved fuel costs and time. They used a sugarcane leaf destresser (Sugarcane Shredder - with 5 HP Engine) machine for leaf destresser from cane. It is suitable for sloping-straight and all types of sugarcane in easy and in a short time. A low-cost tractor-driven boom sprayer (30 liter/min) with a drenching attachment machine is used for spraying pesticides. Now, he is getting 29.80 % more net income over conventional practices from sugarcane crop and reduces the overall cultivation cost of sugarcane up to 28-32% and only sowing cost by 55%. The use of minimum tillage technology and other modified equipment in sugarcane cultivation practices also reduces the cost of weedicides, irrigation charges, costs of labor charges, fuel charges, costs of pesticides, drudgery reduction, and time-saving. He is also getting income from their implements/equipment when used as custom hiring and also sale to other farmers.

Social impact:

The partner farmers and neighboring farmers were fully convinced about zero/minimum tillage sugarcane cutter planter with trench opener & sub-soiler machine, electric power sugarcane bud cutter, hand sugarcane bud cutter, sugarcane power take-off weeder- tractor operated, power takes off the generator for irrigation- tractor operated-3-4 tube well at a time, sugarcane leaf destresser, modified boom sprayer-tractor operated, modified knapsack sprayer and a modified tractor-mounted aero tiller to use the mixing of waste material for proper decomposition. These modified implements are also used as custom hiring at lower charges in neighboring areas and also purchased by several farmers for their sugarcane cultivation practices. Farmer's confidence improved with KVK scientists and sugar mill officials to have a face-to-face discussion and facilitated sharing of knowledge with experiences.

Environmental impact:

The zero/minimum tillage sugarcane cutter planter with trench opener & sub-soiler works as conservation technology because it involves minimum soil disturbance, soil cover through previous crop residues, conserve the moisture, crop residues decomposed in the soil and improve soil health environment and also reduces weed flora, insect-pest and disease infestation These are helping for achieving higher productivity and quality produce. This technology is suitable for climate-resilient agriculture. There are potential benefits of conservation agriculture across different agro-eco-regions of farmers groups. The advantage of this technology is easy adaptability in heterogeneous agro-ecological and socio-economic environments. These modified technologies are conserving resources and enhancing productivity and profitability.

Horizontal/ Vertical spread:

The rapid horizontal/vertical expansion of zero/minimum tillage sugarcane cutter planter with trench opener & sub-soiler attachment technologies for sugarcane planting is ensured. The outcome of these modified technologies is suitable for higher sugarcane production and conserving the resources and it also inspired the farming communities to replace their conventional method of transplanting sugarcane. More than a 100-acre area is being cultivated by these technologies.

Glimpses of zero/minimum tillage technology in sugarcane crop



Zero/minimum tillage sugarcane cutter planter with rotary trench opener & sub-soiler machine



PTO. (Power Take-off) - tractor driven generator operate at a time 3-4 tube wells simultaneously for irrigation in the area of Gandak basin (within 1 kilometer radius)



Modified electric power sugarcane bud cutter and hand sugarcane bud cutter



A view of sugarcane crop planted by zero/minimum tillage



Modified sugarcane leaf destresser machine with 5 HP engine-suitable for slicing all types of sugarcane easily at low cost and in less time



Weeding of sugarcane crop by modified power take off weeder- tractor operated in the presence of scientist of Krishi Vigyan Kendra, Narkatiaganj, West Champaran



Modified boom sprayer-tractor operated and modified knapsack sprayer



Modified tractor mounted aero tiller to use mixing of waste material for proper decomposition