Furrow Irrigated Raised Bed System (FIRBS) Machine

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More than 50% of the cultivated area of the country is rainfed and many crops including soybean are largely grown under such situation. These rainfed crops are often subjected to extreme stresses of soil saturation as well as poor moisture due to erratic rainfall pattern. This erratic behavior is going to further intensify in period to come on account of climate change. It is also well known fact that sizable part of the incipient rain water is lost as surface runoff and thus, rainfall-use efficiency for crop production ranges between 30-45 percent only. Furthermore, it also leads to soil loss of around 2.2 to 6.4 t/ha annually. Thus, by doubling the rainwater use efficiency and minimizing the soil loss, the crop productivity can be substantially enhanced. This can be accomplished by adopting *in-situ* rainwater management strategies which can minimize risk of crop failure vis-à-vis stabilize soybean-based production systems. I*n-situ* rainwater management, conserves rainwater at farm level and also drains out excess water in community drainage channels or can be utilized for recharging ground water for supplemental irrigation for post-rainy season crops, which is otherwise not possible with flat bed planting.

In-situ rainwater management can be carried out either through land configuration techniques or adoption of suitable tillage practices with major emphasis on soil water and nutrient management (SWNM) through selective mechanization and improved cropping systems. This can be achieved by FIRBS machine utilizing furrow irrigated raised bed system (FIRBS) technology.

The Furrow Irrigated Raised Bed System (FIRBS) Machine for Soybean

The FIRBS machine was developed basically to cope up with the problem of moisture stress in the soybean fields. The soil moisture is managed by maximizing the use of rainfall through increased infiltration and moisture retention and reducing runoff and soil erosion. Thus, by this machine, the performance of high yielding improved varieties is optimized by *in situ* moisture management. Surface runoff and deep drainage water is exploited as supplemental irrigation to post-rainy season crops like wheat and chickpea. The same FIRBS machine helps to drain out the excess water from the field to save the crop from water logging condition also.

Tips for successful operation and best results

1. Subsequent to harvesting of *rabi* crop, the field should be deep ploughed and left open as it will help in preparation of quality broad bed. If, it is not possible to practice this every year then it should be done at least once in two or three years. Other normal field preparation operations should also be followed.
2. Deep cultivator should be used in case reversible MB plough is not available.
3. Field leveling should be done after every three years.
4. In vertisols the tractor should be of 45 PTO HP for operating MB plough and the FIRBS machine with ease.

Features and specification of the machine

1. The FIRBS machine has a facility to adjust desired depth of sowing.
2. This is multipurpose machine which can be used for both *kharif* and *rabi* crops simply by adding or removing the furrow openers.
4. FIRBS machine can form channels in alluvial soils with 35 to 40 PTO HP tractors.
5. This machine has a provision to adjust desired row to row distance.
6. FIRBS machine facilitates irrigation through channels easily as and when desired.
7. Crop sown with FIRBS machine has a facility to drain out water in heavy down pour situation with in short period of time through the furrows.
8. FIRBS machine helps to store rain water in the field channels and prevent runoff unlike flat bed sown field.
9. The FIRBS machine frame can be used to remove weed from the beds with the help of tractor with thin tyres by using the sweeps which are provided as an additional option.
10. Additional 3 tines are provided with the machine for use in *rabi* crops.

11. The machine is quite sturdy and has been designed to have minimum breakdown.
12. The FIRBS machine has a facility to cover the sown seeds simultaneously.
13. The machine has provision for 6 rows with 3 additional furrow openers.

Soybean crop sown with FIRBS machine

Cost of machine

The machine presently costs Rs. 54, 860 which is likely to be revised as and when needed. This excludes the cost of transport which is to be borne by buyer.

Procurement

Order and payment for FIRBS machine is to be made to Director, DSR, Khandwa Road, Indore 452001, M.P.

To know further details of the machine, please contact Er. Dev Vrat Singh, Senior Scientist (Farm, Machinery and Power) on E-mail : singhdv123@gmail.com.

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