



Potato Planting Guide and Its Recent Advancement in Mechanization Technologies

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Potatoes have been grown in India for more than 300 years and have become the most common vegetable crop and an important component of Indian diet. Potato is cultivated on about 2141,000 ha area with a production of 51310 thousand MT in India (Anon., 2019). Potato farming is insufficient without the use of potato planters when it comes to its farming. The potato planter is a farm machine for planting potato tubers. A manual planter is often referred to as a bell planter, which may have two farm hands on its back when taking potatoes from a hopper. The duration between potatoes is tolled by a bell, at the sound of which potatoes are thrown down tubes. An automatic planter is hitched and towed behind a field tractor with a three-point linkage. Cups raises and drops tubers of potatoes from a hopper into tubes, where it plants up to 8 drills at a time.

Need of mechanization in potato planter

Earlier, for the sowing of potatoes, a manual planter was used, however the mechanization of farming and the increasing use of tractors contributed to the birth of an automated potato planter. This makes potato planting more successful, quicker and more cost-effective. Adjustable spacing and planting depth also make it viable for different types of soil. It requires a minimum of labour and ensures uniform growth and maturity, thereby ensuring better yields compared to manual planting.

When to plant potatoes

In the case of potato farming, this is another significant factor. The planting time for potatoes in various parts of India varies. Potatoes are a winter or rabi crop in the central plains of India, such as Madhya Pradesh, Gujarat and Orissa. The planting time here, therefore, is during the months of October and November. In the Deccan plateau, potatoes can be both kharif and rabi crops, i.e., in states like Andhra Pradesh, Karnataka and Maharashtra. In other words, in these regions, two potato crops can be grown: from mid-June to mid-July, and then in October and November. In the southern plains, during summer, autumn and spring, potatoes are grown throughout the year. In other words, they are cultivated during April/May, August/September and January.

How to preparing the planting field

Potatoes grow best in cool, well-drained, loose soil that is between 7° and 13° C (45° and 55° F). Often, every day requires at least six hours of sunlight. So, select the location of the field that will get full sun. Grow potatoes in rows spaced about 3 feet apart. Dig a trench approximately 6 inches wide and 8 inches deep with a hoe or round-point shovel, tapering the bottom to around 3 inches wide. Until planting, spread and blend thoroughly rotted manure or organic compost into the bottom of the trench.



Types of Potato Planters

1. Automatic Potato Planter

There is a vertical, revolving picker wheel with cups in this type of planter that picks the potato up and drops it into the furrow. It also has a mechanism to examine whether a seed potato exists in each cup or not. It ensures that at a uniform distance the potatoes are sowed. 2-4 rows of potato planters with a capacity of 6000-14000 potatoes per hour are available on the market. Some of them also come with mechanisms to apply fertilizer. It can be used with tractors that are 35-60 HP and above.



Fig. 1 (a)Tractor mounted automatic potato planter (b) Semi-automatic potato planter

2. Semi-Automatic Potato Planter

It has a revolving horizontal feed ring with cups, but it does not have the mechanism to check whether or not each cup has a seed potato. As a consequence, it needs a worker to check whether or not there is a seed potato in each cup. It also comes as a 2-4 row planter, but with 25-45 HP and above tractors, it is comparatively slower than an automatic planter.

3. High-Speed Automatic Potato Planter

It has a mechanism of the picker-pin type with two picker wheels. In both sides, there are eight picker pins piercing the seed potatoes and positioning them in the furrows. They double the sowing speed, but this does not mean that picker wheels spin at a higher speed that works at half the single wheel's regular speed. It can be powered by tractors of 35 HP and above.

Recent advancements in potato planters

1. Precision potato planter

A high degree of singulation and no missing potato seeds are ensured by a precision potato planter. (Singulation means that only one potato is planted in a single position and no doubling occurs). In addition, the planter ensures correct planting of potatoes, maintaining uniform depth and uniform distance between the tubers. There is just the right amount of soil compaction for the ridges formed over the planted potatoes. This ensures that there is enough water, sunlight and room for each plant to grow, producing healthy tubers and contributing to improved crop yields and quality of potatoes. The planter's design is such that it can be adjusted for changes in the practice of agronomy, such as whole potatoes or cut potatoes, straight line planting or zig zag planting and planting at different depth levels.

2. Potato planters with improved protection against erosion

The cultivation of potatoes, relative to other agricultural crops, needs an especially high level of protection against soil erosion. During heavy rainfall on slopes and especially during the time when the potato has not reached the state of complete canopy establishment, the most serious risk of soil erosion occurs. The potatoes are partly exposed to sunlight in the event of soil erosion, which leads to a green surface of the tubers, so that they cannot be sold. In severe situations, the growth of potatoes in these areas is completely stopped when whole ridges are rinsed off.

Various systems have been introduced recently to protect the potato against soil erosion. Systems that consist of one loosening tine with integrated stone protection and a corresponding small dyking device operating between the ridges are commercially available. It can either be used with a



potato planter or with ridge tillers in combination. The loosening tine loosens the underground and thus improves the soil's water absorption potential. The dyking-share, adapted to the ridge contour, creates water storage traverse-dams (so-called dykes). For a perfect adaptation to the particular soil conditions, different setting possibilities are available. This preserves the fertile soil and ensures the crop has an even supply of water.

Potato Planter Maintenance

Timely repair and maintenance are essential in order to maintain regular service and extend the life of the machine. The following is the completion of maintenance work that needs to be repeated before and after work each time.

Before working

- Each time prior to work, check the flexibility of the rotating parts, the tightness of the drive chain and other parts.
- Identify the issues and make timely fixes. During every shift, add oil at least 2 to 3 times.

After working

- After operation, remove the soil on different sections of the machine every time.
- Conduct a thorough system inspection: change the institutional systems to ensure that the seeder and the opener do not have a sliding and shift phenomenon and no friction.
- If required, replace the machine parts and coat them with oil.
- Place the machine in a ventilated and dry place and preserve it sufficiently for future use.

References

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