

Introduction of Modern Agricultural Equipment's

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Modern agricultural equipment have made farming easier, faster and more efficient. In traditional agriculture, most farm operations were done manually or with animal power, which required more time and labour. Today, machines and modern technologies are used for land preparation, sowing, planting, irrigation, weeding, plant protection and harvesting. Tools such as tractors, cultivators, seed drills, planters, sprayers and harvesters help farmers complete farm operations quickly and accurately. Modern irrigation systems such as drip irrigation, sprinkler irrigation and automated irrigation help in proper and efficient use of water. These tools reduce labour requirements, save time and improve the efficiency of agricultural operations. Thus, modern agricultural tools are important for increasing farm productivity and supporting efficient and sustainable agriculture.

Tractor: A tractor is one of the most important machines used in modern agriculture. It is used for ploughing, harrowing, land preparation, sowing, intercultural operations, spraying and transportation. Different implements can be attached to a tractor according to the requirement of the farm operation. It saves time and reduces human and animal labour.



Cultivator: A cultivator is mainly used for secondary tillage and soil preparation. It helps to loosen and aerate the soil, break soil clods and control weeds. Tractor-operated cultivators can cover a large area in a short period and help prepare a suitable seedbed for crop establishment.



Disc Harrow: A disc harrow is used for breaking soil clods, mixing crop residues and organic matter into the soil and preparing a fine seedbed. It is particularly useful after primary tillage. It also helps in controlling young weeds and improving soil tilth.



Rotavator: A rotavator is a tractor-operated implement used for pulverizing and mixing the soil. It prepares a fine seedbed in comparatively fewer passes. It can also incorporate crop residues and organic materials into the soil, thereby reducing the time required for land preparation.



Plough: A plough is used for primary tillage and turning the soil. It helps to break hard soil layers, bury weeds and crop residues and improve soil aeration. Different types of ploughs are available according to soil type and farming requirements.



Seed Drill: A seed drill is used for sowing seeds at a proper depth and uniform row spacing. It places seeds in rows and covers them with soil. It helps maintain a uniform plant population, improves seed placement and reduces seed wastage. Seed drills are commonly used for wheat, barley, pulses and oilseed crops.



Planter: A planter is mainly used for sowing larger seeds such as maize, cotton and groundnut. It places seeds at a predetermined depth and spacing. Modern planters provide uniform plant-to-plant distance and help achieve better crop establishment while reducing seed requirement.



Transplanter: A transplanter is used for planting seedlings in the field at proper spacing and depth. It is useful for crops such as rice and some vegetable crops. Mechanical transplanting saves labour and time and provides relatively uniform plant spacing.



Power Weeder: A power weeder is used to control weeds between crop rows. It is especially useful in vegetable and horticultural crops. It reduces manual labour and helps maintain a weed-free crop environment during the early stages of crop growth.



Boom Sprayer: A boom sprayer is generally mounted on a tractor and has a long boom fitted with several nozzles. It is used for spraying large areas quickly and uniformly. It is particularly useful for field crops where uniform application of crop-protection chemicals is required.



Agricultural Drone: Agricultural drones are used for crop monitoring, field surveying and, in suitable applications, spraying. They can provide aerial information about crop condition and help identify areas requiring attention. Drones can save time and support precision crop management when used properly.



Fertilizer Spreader: A fertilizer spreader is used to distribute fertilizers uniformly over the field. It reduces the labour required for manual application and improves the uniformity of fertilizer distribution. Proper calibration helps avoid excessive or insufficient application.



Combine Harvester: A combine harvester performs several harvesting operations, such as cutting, threshing and separating grain, in a single machine. It is commonly used for crops such as wheat, rice and other cereals. It saves considerable time and labour during harvesting.



Reaper: A reaper is used for cutting mature crops. It can harvest crops more quickly than manual cutting and is useful when a large area needs to be harvested within a short period. It helps reduce labour requirements during harvesting.



Thresher: A thresher is used to separate grains or seeds from harvested crop plants. It reduces the time and labour required for manual threshing. Different threshers are available for different crops, including wheat, rice, pulses and oilseeds.



Chaff Cutter: A chaff cutter is used to cut fodder crops such as grasses, maize and sorghum into small pieces. It makes fodder easier to handle and feed to livestock. Mechanical chaff cutters reduce the time and physical effort required for fodder preparation.



Laser Land Leveller: A laser land leveller is used to level agricultural fields with high precision. Proper land levelling improves the uniform distribution of irrigation water and can reduce water wastage. It also helps in achieving more uniform crop establishment.



Potato Digger: A potato digger is used to lift potato tubers from the soil and separate them from soil and plant residues. It reduces the labour required for manual harvesting and helps complete harvesting more quickly.



Crop Sensor: Crop sensors are used to collect information about crop and field conditions. They can help monitor crop growth, plant health and nutrient status. The information obtained from sensors can support better decisions regarding irrigation, fertilization and crop management.



Need of Modern Agricultural Equipment's

The increasing demand for food and the shortage of agricultural labour have created a need for modern agricultural tools and machinery. Traditional methods of farming often require more time and physical effort, making it difficult to complete all farm operations on time. Modern tools help farmers manage large areas of land efficiently and complete important operations such as land preparation, sowing, irrigation, weeding and harvesting within the required time. They also help in the efficient use of water, fertilizers, seeds and other agricultural inputs. Modern agricultural tools are also important for reducing production costs and improving the quality of farm operations. With the use of suitable machinery and technology, farmers can increase efficiency and make better use of available resources. Thus, modern agricultural tools are essential for meeting the changing needs of modern agriculture.

Conclusion

The adoption of modern agricultural equipment and technologies represents a significant advancement in transforming traditional agriculture into a more efficient, precise and resource-oriented production system. From land preparation, sowing and crop establishment to irrigation, plant protection, harvesting and post-harvest operations, modern equipment has improved the speed, accuracy and timeliness of farm activities. Technologies such as precision farming, drip and sprinkler irrigation, automated irrigation systems, drones, sensors and GPS-based equipment further enhance the efficient management of agricultural resources. The judicious use of modern agricultural equipment and technologies can reduce dependence on manual labour, minimize wastage of water and other agricultural inputs, overcome operational constraints and improve overall farm productivity. However, their effectiveness depends on proper selection, operation, maintenance and suitability to local farming conditions. Therefore, the future of sustainable agriculture lies in the scientific and efficient integration of modern agricultural equipment and technologies with appropriate agronomic practices. Such integration can contribute significantly to higher productivity, better resource-use efficiency, improved profitability and long-term sustainability of agricultural production.