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NEW DIMENSION OF MECHANISED AGRICULTURE – A VIEW

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Abstract

Agricultural technology is the tools and machinery that are used primarily or entirely in order to support agricultural enterprise. Examples include plows, threshers, and irrigation systems. These forms of technology, which are all regularly used in modern agricultural settings, have a long history in farming and have been reinvented and redesigned many times over. Plows, for example, were originally pulled by animals but now are usually powered by engines. For people who are interested in the history of agricultural technology, there have been improvements to technology that have greatly changed the ways in which certain types of crops were grown or harvested.

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Mechanised Agriculture

Mechanized agriculture is the process of using agricultural machinery to mechanize the work of agriculture, greatly increasing farm worker productivity. In modern times, powered machinery has replaced many jobs formerly carried out by men or animals such as oxen, horses and mules. The history of agriculture contains many examples of tool use, but only in recent time has the high rate of machine use been at such a level. The first pervasive mechanization of agriculture came with the introduction of the plough, usually powered by animals. It was invented in ancient Mesopotamia. Current mechanized agriculture includes the use of Tractors, trucks, combine harvesters, airplanes (crop dusters), helicopters, and other vehicles. Modern farms even sometimes use computers in conjunction with satellite imagery and GPS guidance to increase yields. Mechanization was one of the factors responsible for urbanization and industrial economies. Besides improving production efficiency, mechanization encourages large scale production and improves the quality of farm produce. On the other hand, it displaces unskilled farm labour, causes environmental pollution, deforestation and erosion.

Various Kinds of Machinery Used in Agricultural Processes

Traction and Power

A tractor is an engineering vehicle specifically designed to deliver a high attractive effort (or torque) at slow speeds, for the purposes of hauling a trailer or machinery used in agriculture or construction. Most commonly, the term is used to describe a farm vehicle that provides the power and traction to mechanize agricultural tasks, especially (and originally) tillage, but now a days a great variety of tasks. Agricultural implements may be towed behind or mounted on the tractor, and the tractor may also provide a source of power if the implement is mechanized in our agricultural system.

Soil Cultivation

Cultivator

A cultivator is any of several types of farm implement used for secondary tillage. One sense of the name refers to frames with teeth (also called shanks) that pierce the soil as they are dragged through it linearly. Another sense refers to machines that use rotary motion of disks or teeth to accomplish a similar result.

Cultivators of the toothed type are often similar inform to chisel plows, but their goals are different. Cultivator teeth work near the surface, usually for weed control, whereas chisel plow shanks work deep beneath the surface, breaking up hardpan. Consequently, cultivating also takes much less power per shank than does chisel plowing. Small toothed cultivators pushed or pulled by a single person are used as garden tools for small-scale gardening, such as for the household's own use or for small market gardens. Similarly sized rotary tillers combine the functions of harrow and cultivator into one multipurpose machine.

Cultipacker

A cultipacker is a piece of agricultural equipment that crushes dirt clods, removes air pockets, and presses down small stones, forming a smooth, firm seedbed. Where seed has been broadcast, the roller gently firms the soil around the seeds, ensuring shallow seed placement and excellent seed-to-soil contact.

Harrow

There are four general types of harrows: disc harrow, tine harrow, chain harrow and chain disk harrows. Harrows were originally drawn by draft animals, such as horses, mules, or oxen, or in some times and places by manual labourers. In modern practice they are almost always tractor-mounted implements, either trailed after the tractor by a drawbar or mounted on the three-point hitch.

Stone Picker

A stone picker (or rock picker) is an implement to remove the top layer of soil to separate and collect rocks and soil debris from good topsoil. It is usually tractor-pulled. A stone picker is similar in function to a rock windrower (rock rake); a stone picker generally digs to greater depths to remove stones and rocks.

Roller

The roller is an agricultural tool used for flattening land or breaking up large clumps of soil, especially after ploughing. Typically, rollers are pulled by tractors or, prior to mechanisation, a team of animals such as horses or oxen. Flatter land makes subsequent weed control and harvesting easier, and rolling can help to reduce moisture loss from

cultivated soil. On grassland, rolling levels the land for mowing and compacts the soil surface.

Planting

A transplanter is an agricultural machine used for transplanting seedlings to the field. This is very important as it reduces the time taken to transplant seedlings (when compared to manual transplanting), thus allowing more time for harvesting. Machine transplanting using rice transplanters requires considerably less time and labor than manual transplanting. It increases the approximate area that a person can plant from 70 to 10,000 square me/ters per day.

Irrigation

Various kinds of irrigation is practiced in order to overcome from water scarcity and to save water. The following are the types of irrigation.

Drip Irrigation

Drip irrigation also known as trickle irrigation or micro irrigation or localized irrigation, is an irrigation method that saves water and fertilizer by allowing water to drip slowly to the roots of plants, either onto the soil surface or directly onto the root zone, through a network of valves, pipes, tubing, and emitters. It is done through narrow tubes that deliver water directly to the base of the plant. Water distribution is highly uniform, controlled by output of each nozzle and Labour cost is less than other irrigation methods.

Center Pivot Irrigation

Center pivot irrigation is a form of sprinkler irrigation consisting of several segments of pipe joined together and supported by trusses, mounted on wheeled towers with sprinklers positioned along its length. The system moves in a circular pattern and is fed with water from the pivot point at the center of the arc. These systems are found and used in all parts of the world and allow irrigation of all types of terrain. Newer systems have drop sprinkler heads as shown in the image that follows.

Harvesting/post-harvest

Baler

A baler is a piece of farm machinery used to compress a cut and raked crop (such as hay, cotton, straw, or silage) into compact bales that are easy to handle, transport, and store. Several different types of balers are commonly used, each producing a different type of bales – rectangular or cylindrical, of various sizes, bound with twine, strapping, netting, or wire.

Bean harvester

A bean harvester, also known as a bean thresher or bean combine, is a threshing machine which is used to harvest beans. It mainly consists of a pickup, several beaters,

shakers, one or several fans, elevators, conveyor belts, a storage bin, and usually a spreader at the rear. Until recently, the only practical manufacturer of bean harvesters was The Bidwell Bean Thresher Company.

Sugarcane Harvester

A sugarcane harvester is a large piece of agricultural machinery used to harvest and partially process sugarcane. The machine, originally developed in the 1920s, remains similar in function and design to the combine harvester. Essentially a storage vessel on a truck with a mechanical extension, the machine cuts the stalks at the base, strips the leaves off, and then cuts the cane into segments. These are then deposited into either the on-board container, or a separate vehicle traveling alongside. Waster material is then ejected back onto the field, where it acts as fertilizer.

Thrashing Machine

The thrashing machine, or, in modern spelling, threshing machine (or simply thresher), was a machine first invented by Scottish mechanical engineer Andrew Meikle for use in agriculture. It was invented (c.1784) for the separation of grain from stalks and husks. For thousands of years, grain was separated by hand with flails, and was very laborious and time consuming, taking about one-quarter of agricultural labor by the 18th century. Mechanization of this process took much of the drudgery out of farm labour.

Summary

The introduction of machines in agricultural processes like soil cultivation, method of irrigation, harvesting and post harvesting etc. is inevitable. Agricultural technologies and knowledge have recently created and invented by public institutions and scientists. Apart from mechanized methods, biotechnology for agricultural production has developed rapidly. As a result the production rate has also grown from year to year.

This boost in food production has been increased due to the scientific advances and new technologies, including the development of new crop varieties, the use of pesticides fertilizers, and the construction of large irrigation systems.

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