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MULTIPURPOSE AGRICULTURE MACHINE

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Abstract:

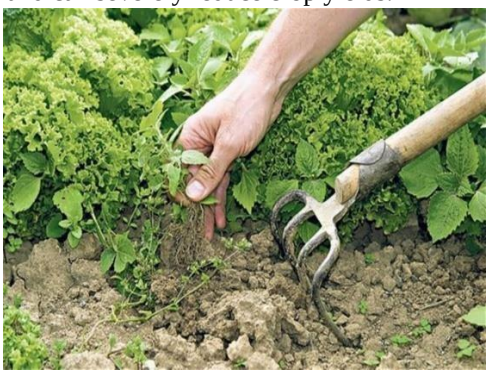
Presently, small land holding farmers use heavy equipment's for land preparation mostly. Their usage can be increased and made more economical by using them for other farm operations such as soil linear, weed removing and carry some loads to their cultivating land. Manual method of weed removing results in taking more time, low crop yield and serious back ache for the farmer which limits the size of field that can be planted. The cost price of imported planters has gone beyond the purchasing power of most of our farmers. Farmer has to use various agricultural equipment's and labors for caring out those steps, our purpose is to combine all the individual tools to provide farmers with multipurpose equipment which implements all the scientific farming techniques and specifications which suitable for all type of seed to seed cultivation with as minimum cost as possible.

1. Introduction:

Introducing advanced technology for plowing &weed removal, a plowing machine is done with using simple operation which gives more work efficient & meanwhile it produced in lower price, this equipment is useful to farmers for plowing weed removal & so on, the tool holder which is provided is very strong and useful to adopt different types of agriculture tools for different agriculture operations, this machine is very cheap in cost & can today's world everything is getting modernized. Agriculture fields are slowly destroying & these lands are used for some other purpose this is because the income from agriculture is less, although the work involved is high. Most of the work in agriculture is done manually, so the farmers depend on labors for doing it, other sectors like industries, construction were also involves huge labors work hence workers prefer those jobs so the agriculture sector takes shortfall of man power this is being the scenario hence workers are not available for work such as plucking out of unwanted grass & weed growing in between crops. It is very important to pluck out the grass and weeds in order to obtain fruitful results from the cultivation, as the grasses and weeds observe apart of nutrition given to the plants .Given the present situation, removing weeds becomes a costlier affair In order to address this problem a simple, economical & efficient machine remove weed plowing other operations, which would be operated by a single person which saves the person savings &labor time. The machine has been designed, fabricated & tested.

Weed Removing:

Farmers are often concerned that weeds may reduce crop yields. Weeds use the same nutrients that crop plants use, often in very similar proportions. They also use resources such as water, sunshine and space that might have gone to crops. The more similar the weed and crop requirements, the more they will compete for those resources. Weeds that compete aggressively with crops reduce their yield. Weeds are most damaging to crop yields if they have some advantage over the crop. Two factors are especially important density, timing. More weeds are generally a larger problem than few weeds, but weed density is not the only concern. For instance, at very high densities, green foxtail plants tend to compete strongly with each other and thus remain very small. These small plants probably have little competitive effect on the crop even when there are many of them. At medium densities, green foxtail plants grow larger and can severely reduce crop yields.



Weeds cause many problems. Most importantly, weeds can reduce crop yield. Weeds cause greater crop losses if they occur in large numbers, if they get a head start on the crop, if they are especially vigorous, or if they produce allopathic substances.

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Soil Linear:

Arrangement of soil is important for cultivate anything in the agricultural land for that soil must arrange in certain row format because by that seed can inserted properly in an row and that seeds grows the plant in correctly as seed inserted in soil using soil linear also it restricted in space because of un equal arrangement . So this lining must in prober arrangement for cultivating land. Aeration and porosity: Atmospheric air contains elements such as oxygen, nitrogen, carbon and others. These elements are prerequisites for life on Earth. Particularly, all cells (including root cells) require oxygen to function and if conditions become anaerobic they fail to respire and metabolize. Aeration in this context refers to the mechanisms by which air is delivered to the soil Drainage in soils of bad drainage the water delivered through rain or irrigation may pool and stagnate. As a result, prevail anaerobic conditions and plant roots suffocate. Stagnant water also favors plant- attacking water molds. In soils of excess drainage, on the other hand, plants don't get to absorb adequate water and nutrients are washed from the porous medium to end up in groundwater reserves.

Plowing:

Plowings important process in agricultural its implemented since the beginning of history, used to turn and break up soil, to bury crop residues, and to help control weeds. The antecedent of the plow is the prehistoric digging stick. The earliest plows were doubtless digging sticks fashioned with handles for pulling or pushing. By Roman times, light, wheel less plows with iron shares (blades) were drawn by oxen; these implements could break up the topsoil of the Mediterranean regions but could not handle the heavier soils of northwestern Europe. The wheeled plow, at first drawn by oxen but later by horses, made possible the northward spread of European agriculture. The 18th –century addition of the moldboard, which turned the furrow slice cut by the plowshare, was an important advance. The three-wheel sulky plow followed and, with the introduction of the gasoline engine, the tractor-drawn plow. Rotary plows or tillers (sometimes called rot tillers) have curved cutting knives mounted on a horizontal power-driven shaft. The pronged rotary hoe, a plow used chiefly for seedbed and weed control, works well at high speed. The plowing is used for various purposes of agriculture for different according to the soil they used for their cultivation these makes huge role cultivating.

Deep tillage implements, used chiefly to break up hardpan and packed soils, include The small size, so this purposes their use the man power to work for their land that leads to the cultivate rate must get slower and they need many person's for their work. Even through in the market having a equipment's that been compact in size and that may suitable , but that equipment's may useful for a single purposes so that problem is fixed the subsoil and the chisel plow. The subsoil must be pulled by a heavy tractor, for its steel- pointed shank is capable of penetrating the subsoil to a depth of three feet. The chisel plow, or ripper, has several rigid or spring- toothed shanks with double pointed shovels mounted on a transverse bar at intervals of one to three feet. Plowing depths vary from a few inches to 1.5 feet.

Problem Identification:

The small land holding formers and the people who having a small gardens have facing the major issue is that, They are don`t need any bulk equipment's like tractor and other machines. So the need a machine that use for them as a small size which is been compact to their land to use it. by using the multi purposes machine for their production. India is majorly an agricultural country, but the conditions of farming and farmers have to improve a lot. There are many problems, which face Indian agricultural, and as every Indian state has a different method of framing. So there is not just one solution to fit similar problems. In

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India, productivity of crops is extremely low, which keeps the farmers poor. There should be an effort on the government's part to step up education for farmers regarding crop rotation, multiple cropping, crop insurance, irrigation facilities, finance etc.

Design and Fabrication:

Parts & Wheels:

The wheels we used in the equipment in the width of 1.75 inch and 16 inch in diameter. The wheel is made up of rubber in outer and the rim made up of the aluminum with these linked with the steel spokes. Wheel is a circular block of a hard and durable material at whose center has been bored a circular hole through which is placed an axle bearing about which the wheel rotates machines. When placed vertically under a load-bearing platform or case, the wheel turning on the horizontal axle makes it possible to transport heavy loads; when placed horizontally, the wheel turning on its vertical axle makes it possible to control the spinning motion used to shape materials when mounted on a column connected to a rudder or a chassis mounted on other wheels, one can control the direction of a vessel or vehicle when connected to a crank, the wheel produces or transmits energy.

Handle:

This handle is made up of thin steel that gives high strength in using at any situations this material can withstand more force that acting between the machine and the man power to pull the equipment forward. This purpose of using at surfaces may give more resistance force to neglect that forces the must be not get deflection at point. In this equipment has two stages of handle that be connected using the bolts and nuts for adjustment of handle that requires as per the height of the person who operates the machine. That must be tightly fixed using bolts and nuts. A handle is a part of, or attachment to, an object that can be moved or used by its connected with hand. The design of each type of handle involves substantial ergonomic issues, even where these are dealt with intuitively or by following tradition. Handles for tools are an important part of their function, enabling the user to exploit the tools to maximum effect. Package handles allow for convenient carrying of packages.

Frame:

The Front area is having a rectangular shape box that attached with the wheel for connect the tool at the end of the frame. This frame is made by the material of HSS steel can withstand more weight and force and also the frame connecting with handle by using bolt and nuts. The frame that gives additional support to attachment of wheels and also used for the carry some so load in feature it may use for the carry out some equipment's. A frame is often a structural system that supports other components of a system that helps to get attached with body of the equipment. There are many types of frame in the industries we use steel frame because it carry over high strength and not get deflected easily. The main function of the frame is having rectangle space is used to carry some loads to the field that space and frame can withstand more 20 kg of weight. This is the ne of the major advantage of this equipment, because the farmers may use carry some required things to take use in the field so that purpose full fill from this function in the vehicle. The tool is connected with the frame by the help of space given to connect the tool using bolt and nuts the required tool may fix for the required purpose this is main function of the frame. There are many types of frame in the industries we use steel frame because it carry over high strength and not get deflected easily.

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Tools:

Weed Removing Tool:

This tool having the six number of sharp edges this tool is mainly made up of the TMT rod steel for the weed removing because that can be removed by this full depth of to root so this tool need a sharp edged to penetrate in the soil .

These six strips are attached parallel with the one square for the length 13 inch that square pipe is drilled with drilling machine for two places in the machine for connecting the bolts and nuts that used to connect and attach in the frame in tool holding places. Those six strips are connected with that rod by using welding.

Soil Liner:

This tool is come with pair of attached with frame there are two different parts in that used for soil liner this both tool be attached in the both sides corner of the frame that hold by using the bolt and nuts and that tool is may get deflected while using in the land.

This operation mostly carry over's in the field in large cultivating areas may use the tractor because it full fill the land quickly with high in depth but that may get more in cost This tool is made up of HSS steel that may withstand high loads and forces is that shaped slightly at edge of the tool. This both tool is having difference in each by the angle of turned at the tool edge this edge is connected frame.

Plowing Tool:

This plowing tool is in triangular shape with containing sharp edges at the end of the machine because it used to penetrate in the deep soil. This tool is made up of HSS steel. Farmers and home gardeners alike use a plow, also spelled plough, to break up weeds, aerate the soil, and create a loose layer of topsoil and to arrange the soil into hills or furrows. Plowing is an essential practice to ensure the success of a crop or garden. Without plowing, weeds can out-compete sown crops, soil will Walk-behind plows consist of a rotary blade that digs down into the soil and chops it in one pass. These plows are gas-powered, but manual versions do exist. Additionally, if you have a riding lawn mower, you may be able to attach a special version of a farm plow to the back.

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Welding:

Welding used in this process of joining the metals is electric welding. Electric welding is not maintain healthy levels of oxygen and seeds may struggle to take root in compact soil. Although tractor-powered plows represent an efficient option for large plots, they are cost prohibitive or simply impractical for most home gardeners. Many options exist for home gardeners and can fit any budget or preference. Finally, hand tools can be used for small plots. A tool called a hoe or ho allows you to slice into the soil, pull it into a hill or furrow and chop it into smaller pieces. These either have long handles or can be used while standing or they can be found with short handles in order to allow you to work on your hands and knees. Plowing is an essential practice to ensure the success of a crop or garden. Without plowing, weeds can out-compete sown crops, soil will not maintain healthy levels of oxygen and seeds may struggle to take root in compact soil. a welding process that is used to join metal to metal by using electricity to create enough heat to melt metal, and the melted metals when cool result in a binding of the metals. It is a type of welding that uses a welding power supply to create an electric arc between a metal stick electrode and the base material to melt the metals at the point of contact. Arc welders can use either direct (DC) or alternating (AC) current, and consumable or non-consumable electrodes.

Today is one of the most exciting times to be in the welding industry. As technology continues to become more complex, welders are needed to put the pieces together. Whether you're exploring careers in the field, are an industry veteran, or are someone in between, Welding.com is your one-stop shop for essential industry information. Since 1995, we've helped thousands of small to medium sized businesses become more efficient, find new avenues for growth, and cut their costs of business. Each year over 500,000 individuals come to us for essential information. As welding professionals, ourselves, we know the pains and challenges you face on a day to day basis. That's why our site is a one- stop shop for a variety of welding topics. Power supply the electrical energy necessary for arc welding processes, a number of different power supplies can be used. The welding, the voltage is directly related to the length of the arc, and the current is related to the amount of heat input. Constant current power supplies are most often used for manual welding processes such as gas tungsten arc welding and shielded metal arc welding, because they maintain a relatively constant current even as the voltage varies. An electric current is used to strike an arc between the base material and a consumable electrode rod or stick. The electrode rod is made of a material that is compatible with the base material being welded and is covered with a flux that gives off vapors that serve as a shielding gas and provide a layer of slag.

MIG welding is one of the easier types of welding for beginners to learn. MIG welding is actually two different types of welding. The first uses bare wire and the second flux core. Bare wire MIG welding can be used to join thin pieces of metal together. Flux core MIG welding can be used outdoors because it does not require a flow meter or gas supply. MIG welding is usually the welding of choice for DIY enthusiasts and hobby welders who don't have the money to spend on expensive equipment. Stick welding, also known as Arc welding, is doing it the old fashioned way. Stick welding is a bit harder to master than MIG welding, but you can pick up a stick welding equipment for very little if you want to have a go at home. Stick welding uses a stick electrode welding rod.

Drilling:

Drilling is a cutting process that uses a drill bit to cut a hole of circular cross section in solid materials. The drill bit is usually a rotary cutting tool, often multi-point. The bit is pressed against the work-piece and rotated at rates from hundreds to thousands of revolution. This forces the cutting edge against the work- piece, cutting off chips from the hole as it is drilled. In rock drilling, the hole is usually not made through a circular cutting motion, though the bit is usually rotated. Instead, the hole is usually made by hammering a drill bit into the hole with quickly repeated short movements. The hammering action can be performed from outside the hole within the hole, Drills used for horizontal drilling are called drifter drills. Drilled holes are characterized by their sharp edge on the entrance side and the presence of burrs on the exit side (unless they have been removed). Also, the inside of the hole usually has helical feed marks.

Drilled holes are characterized by their sharp edge on the entrance side and the presence of burrs on the exit side (unless they have been removed). Also, the inside of the hole usually has helical feed marks. Drilling may affect the mechanical properties of the work piece by creating low residual stresses around the hole opening and a very thin layer of highly stressed and disturbed material on the newly formed surface. This causes the work piece to become more susceptible to corrosion and crack

propagation at the stressed surface. A finish operation may be done to avoid these detrimental conditions. For fluted drill bits, any chips are removed via the flutes. Chips may form long spirals or small flakes, depending on the material, and process parameters. The type of chips formed can be an indicator of the machinability of the material, with long chips suggesting good material machinability. When possible drilled holes should be located perpendicular to the work piece surface. This minimizes the drill bit's tendency to "walk", that is, to be deflected from the intended center- line of the bore, causing the hole to be misplaced. The higher the length-to-diameter ratio of the drill bit, the greater the tendency to walk. The tendency to walk is also preempted in various other ways, which include: external). Using methods such as a rotating tool and counter-rotating work piece are common techniques to achieve required straightness tolerances. Secondary tooling methods include trepanning, skiving and burnishing, pull boring, or bottle boring. Finally a new kind of drilling.

Working Principle:

The working process of this equipment starts from the attachment of the required tool to fix for the required operation that going to done in machine. This tool is fixed by using the bolts and nuts. After fixing the required tool then handle must be fixed for required height this may varies from person to person. Then the machine must be move forward by the man power. The soil must be in suitable state for those operations that going to done. Weed remover operations is done by fixing the weed removing tool with the equipment. They must be in suitable conditions that contain water in farming land. The tool must fix properly Deep hole drilling is generally achievable with a few tooling methods, usually gun drilling or BTA drilling. These are differentiated due to the coolant entry method (internal or external) and chip removal method (internal or technology is available to face this issue: vibration drilling. This technology breaks up the chips by a small controlled axial vibration of the drill. The small chips are easily removed by the flutes of the drill. Then the required force is given to the tool to removing the weed. The soil liner working also as same as the weed remover the required tool is fixed then that soil must be suitable conditions to take over that operation. Then equipment moves forward by man force that given to the equipment by this the soil liner operation is donned. The plowing is required some conditional state of the soil is must. Because this operation required with needs a more force that given to the tool then only the required depth is achieved through that plowing tool. Mostly all working is same as the process that may get difference in the force applied to the machine and condition of the soil maintained. The difference in height of handle its makes a difference in depth and force given to the tool.

Advantages:

- Used as trolley: The machine frame is designed as to carry a load by this farmers can take over some things to their land easily.
- Tool can be easily changeable: There are three tools are given that may interchangeable to required operations easily with nuts and bolts.
- Multipurpose usage in one machine: This single machine that being used for three different operations like plowing, soil liner, and weed removing
- Handle height is adjustable: The handle is easily adjustable to required positions and angles that may useful to persons that operating machines. These
- Low cost compare with other market garden machines: This is major advantage of this project this whole setup is being manufactured by in most affordable prize.

Conclusion:

This project entitled Design and Fabrication of Multipurpose plowing machine is successfully completed and the results obtained are satisfactory. It will be easier for the people who are going to take the project for the further modifications. It very useful for small scale farmers. The cost can be reduced by using this type of vehicle. The agricultural operation is made easier. The reduction in cost of the plough tool is done and the life is also increased. Multipurpose equipment is designed and fabricated with low-cost, easy to use and effective equipment for agriculture. The main task now is to promote this technology and have available to farmers at an affordable price. The multipurpose farming machine can be readily made from local components in workshops. This machine is more beneficial to small farmer who cannot afford farming equipment at higher cost. And one person can be easily handle this machine.

Future Scope:

In the future, the major issue of using the man power may fixed by using the engine that runs with the help of the solar power it may be efficient in using at the farm lands. This feature may reduce the working load of the man who operates the equipment. The front frame is free in this equipment that place may use for placing the engine and the solar panel. This process may help formers to finish up the production at quick time it increases the production rate. This addition in equipment is leads to increase in cost but not in very much difference because we use solar panel for power production. The changes may apply in machine at wheels and the frame design and overall strength of the machine must increase. So this addition in machine is helps more in this machine.

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