DEVELOPMENT OF MULTIPURPOSE SPRAYER- A REVIEW

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Abstract - Automation for spraying in the field of agriculture has increased the productive output of the farms. Owing to this, labor problem has been solved. But the scenario in the country like India is different. The agriculture field being small, automation is such places are a difficult task also the economic condition of majority of Indian farmers is not well to do. Therefore, the manually operated sprayer finds widespread application in such condition. In Indian farms two types of sprays are used: Hand operated and Fuel operated pump. The main drawback of hand operated spray pump is that the user cannot use it for more than 5-6 hours continuously as he gets tired whereas fuel operated spray pump requires fuel which is expensive and availability of fuel is not easy at rural places. In such situation we should think to move towards non-conventional energy. This review paper tries to develop a new mechanical system which will overcome all the above problems and will help farmers to.

Key Words: Sprays, Multipurpose Sprayer, Agriculture,
• Shivaraja Kumar Parameswaramurthys paper on design and development of wheel and pedal operated sprayer - It is a portable device and no need of any fuel to operate, which is easy to move and sprays the pesticide by moving the wheel and also peddling the equipment.
• Sandeep H. Poratkar, Dhanraj R. Raut,"Development of Multinozzle Pesticides Sprayer Pump"- This paper suggests a model of manually operated multi nozzle pesticides sprayer pump which will perform spraying at maximum rate in minimum time. Constant flow valves can be applied at nozzle to have uniform nozzle pressure.
• Varikuti Vasantha Rao Sharanakumar Mathapati Dr. Basavaraj Amarpur, "Multiple Power Supplied Fertilizer Sprayer"

3. IDENTIFICATION & RESEARCH
Mostly in India we used the old method and equipment for the agriculture. For agriculture the pesticide and water is mostly required after the some interval of time to remove the insect from the agriculture land. In old equipment only one work has been performed at a time due to which the time as well as effort required is more. To remove the insect from the land we first put the pesticide and after that we give the water or another pesticide due to lack of technology. Even we required at the same time two pesticide.

4. TYPES OF SPRAYERS

4.1 KNAPSACK SPRAYERS
These sprayers are on the back of worker during operations. Tanks may be plastic or metal. Common Knapsack sprayers are:
1. Hydraulic
2. Manual pneumatic and

4.1.1. HYDAULIC SPRAYER
This is the manually operated sprayer, works with the help of hand lever to maintain constant pressure and has a tank capacity of 15 liters. This sprayer is used particularly for spot treatment.

4.1.2. PNEUMATIC OR COMPRESSED SYSTEM KNAPSACK
In this sprayer, pumping is not necessary during spraying. After filling the liquid 2/3rd capacity the tank is pressurized. It is used in limited amount to spray on weeds in paddy and jute.

4.1.3. MOTORIZED PNEUMATIC SPRAYERS
As a low volume sprayer suitable for spraying concentrated spray liquid. A blast of air flows through spraying jet of delivery hose and nozzle tube and ejects spray liquid in fine droplets. Air blast atomizes spray liquid in to fine droplets. Air acts as carrier. Faster the air is pressured more the atomization. Theses prayers are also used as blowers. Mist blower cause considerable loss of herbicide blower is: by winds. The main advantages of Knapsack are: 1. Portable working, and 2. fast spraying. Suited to post emergence translocate type. Herbicides as low volume Spraying is not so uniform with Knapsack blowers. Liquid - 60 liters / ha swath 7 to 8 m.

4.2 FOOT SPRAYER/PEDAL PUMP SPRAYERS
This sprayer is operated by foot and popularly used for CPP application. It has provision of 1–2 long delivery hoses, fitted with either lance or 2-6 nozzle booms. This sprayer has advantage of high volume spray and covers large area.

4.3. TRACTION PNEUMATIC SPRAYER
Indian Institute of Sugarcane Research, Lucknow has developed bullock drawn sprayer with size nozzle boom that is powered from the wheels of the frame. It is efficient, easy to operate and simple in its construction. It uses two pneumatic pumps and develops maximum pressure of 2–8 cm2 which is suited to minimize spray drift. Area covered is 2-3 ha/day equipment.

5. SPRAYING METHODS

5.1. BACKPACK SPRAYER
This is a hand operated sprayer loaded on the back of the worker. Another type of backpack sprayer has a hand-operated hydraulic pump that forces liquid pesticide through a hose and one or more nozzles. The pump is usually activated by moving a lever: A mechanical agitator plate may be attached to the pump plunger. Some of these sprayers can generate pressures of 100 pounds per square
inch (psi) or more. Capacity of both these types of backpack sprayers is usually 5 gallons or less.

**5.2. Motorcycle Driven Multi-Purpose Farming Device (Bullet Santi)**

In 1994, Mansukhbhai Jagani, developed an attachment for a motorbike to get a multi-purpose tool bar. In which, addresses the two problems of farmers in Saurashtra namely paucity of laborers and shortage of bullocks. This motor cycle driven plough (Bullet Santi) can be used to carry out various farming operations like furrow opening, sowing, inter-culturing and spraying operations. Mansukhbhai’s intermediate-technology contraption proved efficient and cost-effective for small-sized farms.

**5.3. AERIAL SPRAYER**

This type of spraying technique is generally applied on large farms. In aerial spraying, the spraying is done with the help of helicopter which is controlled by the remote. In this the multi-nozzle sprayer is attached to it and sprayed from some altitude. This kind of spraying technique consumes less time and required less human effort.

**REFERENCES**


