

AGRICULTURE EQUIPMENT

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Specifications

Inputs Required

The fabrication process involves casting and/or machining, drilling, assembly. The unit also requires testing and calibration. The approximate requirements are (likely to vary depending on the actual steps adopted):

- Space: 5mx4m with 230V power supply
- Machines/Apparatus/Equipment: Centre lathe (1.1 kW), drilling machine, casting facility, brazing facility. Dead weight tester for calibration.
- Personnel: Machine man (one), technician (one) for assembly and testing.

Raw Materials

Aluminum, Perspex, Stainless Steel and Brass for casing and diaphragm. Optical fibre, connectors, LED, photo detector, ICs (all bought out items).

Production Capacity

- Average time for making one piece: 6 hours.
- Testing of one piece: 1 hour.

Cost per Unit

- High pressure transmitter : Rs 5000/- (approx.)
- Low pressure transmitter : Rs. 3000/- (approx.)

Cryogenic Grinding Machine

Description

It is a cryogenic grinding machine for spices, vegetables, food grains, plastics and polymers.

Advantages

The key benefits of this machine are:

- Minimizes changes in colour, flavour, microbial population and nutritional values
- Minimizes man power requirement
- Facilitates rapid handling of products which are otherwise difficult to grind
- Produces a packaged product of uniform appearance

Applications

This machine finds application in Spice, Vegetables, Food Grains, Plastics and Polymer Processing Industries

Target countries

Developing Countries

Collaboration Options

Technology Transfer and Consultancy Service

Organisation

Indian Institute of Technology, Kharagpur

Specifications

Inputs Required

Supply of liquid nitrogen and electricity for running motors and a grinder capable of withstanding liquid nitrogen temperature

Raw Materials

Spices, Vegetables, Food Grains, Plastics and Polymers

Production Capacity

5 kg per hour for Shrimp

Cost per Unit

Depends on the price of liquid Nitrogen available

Machine Vision System for Detection and Removal of Contaminants in Cotton

Description

Cotton collected from fields by workers contain different types of contaminants such as seed coat, human hair, beedi tips, bird feather, husks, plastic, paper etc. These contaminants hinder the spinning of yarn; affect the quality of thread and subsequently weaving of clothes.

The limitations of the presently used methods like plane thresholding, scanner system, and Chinese technique has led to the development of a system with the application of image processing based on hue thresholding and masking the plane.

The system consists of three major parts-PC based machine vision, image processing and controls. These broadly include CCD camera, image grabber, personal computer, Fluorescent lamp, 16 pin BNC connector and digital I/O.

The contaminated cotton kept in a transparent case is subjected to light which focuses the image by means of lens on the camera which is grabbed by image grabbing unit. The said image is processed by the computer program to display contaminants. The intensity of light generates the control signal for driving away contaminants. Contaminants upto .1 mm size and almost all the defects other than pure cotton can be detected.

Advantages

It is a low cost system using simple white light that can work with poor lighting and one light source. All types of contaminants even those in moving turf can be detected. It is independent of the physical position of cotton and probability of contaminants.

Applications

Exporters and processors of raw cotton and spinning mills are the prospective users.

Target Countries

Developing countries

Technology has been patented under Indian Patent Application No.926/DEL/2002 dated 12.8.2002 with title "Machine Vision System to Detect Contaminants from Cotton".

Collaboration Options

Technology Transfer and Consultancy Service

Organisation

Indian Institute of Technology, Delhi

Specifications

Approx. Cost of the Device: Rs. 3,50,000

Equipment and Facility Required: Basic fabrication and assembly facilities are required with an investment less than Rs. 50,000

Major Components Required:

- Personal Computer
- Image Grabbing Unit
- Image Processing Card
- Commercially Available Programming Language

Tractor Mounted Air Carrier Sprayer Using Axial Flow Blower

Description

The Air Carrier Sprayer is meant for spraying mango orchards especially of modern varieties. It is mounted on the three-point linkage of 35 hp four wheel tractors. The equipment includes the following components:

- Blower having two air outlets fitted with spray nozzle booms: In an air-carrier sprayer, blower is the heart of the system. Axial flow blower with 8 blades and fabricated using fibre reinforced plastic is used. Impeller diameter is about 0.60 m. straight blades having camber section is used. There are two spray outlets, which direct the spray discharge onto the sides of the tractor and towards the trees. At each outlet spray nozzles are fitted at appropriately selected orientations. Power to blower was transmitted from PTO drive of the tractor through belt and pulleys. The transmission ratio is selected to give a blower speed of 2400 rpm at the rated speed of 540 rpm of the PTO
- Hydraulic pressure pump: Sprayer pump of at least 5 litre/min flow rate and about 3.6 kg/cm² delivery pressure is to be used. Pump is driven by the tractor PTO
- Spray liquid tank and strainer: Plastic spray tank of about 100 litre capacity can be used. A plastic strainer is to be provided at the inlet of the spray pump
- Safety pressure relief and by-pass valve: a pressure relief cum by-pass valve is used at the delivery side of the pump. The by-pass flow is diverted to the tank, which provides partial agitation
- Sprayer main frame: The main frame is used for laying out the tank pump, blower, power transmission from PTO to pump and blower and other minor accessories. The frame can be mounted on the three-point linkage of the tractor. The sprayer is carried by the tractor during spraying operation which is achieved by the mounting system
- Pressure pipeline for spray liquid
- Cut-off valves
- Power transmission system from tractor PTO to pump and blower

The best spray distribution in terms of volume mean diameter (vmd) and droplet density across different locations in the trees is obtained at recommended setting of the nozzles at the blower outlets. The vmd ranged between 114 and 122 μm and droplet density between 110 and 117 per cm². The spray had a vmd/nmd ratio of 1.5 to 1.8. During field trials a spray application rate of 70-80 l/ha was used. The machine covered one hectare area in 0.49 hr.

Advantages

The key benefits of this system are: It can be operated by commonly available tractors. It covers one hectare in 29 minutes, approximately. The cost of spraying operation is smaller compared to both the traditional manual methods and the radial flow blower based air assisted sprayers.

Applications

This technology finds application in Mango orchards and crops of similar plant canopy

Target countries

Developing countries

Collaboration Options

Technology Transfer and Consultancy Service

Organisation

Indian Institute of Technology, Kharagpur

Specifications

Inputs Required

Sprayer requires input power through tractor PTO; and spray liquid filled in the spray liquid tank.

Raw Materials

Different components are described in description above

Cost per Unit

It covers a hectare area in 29 minutes. Economics depend on tractor to which it is attached.

Soil Moisture Sensor for Automated Micro Irrigation System

Description

It is a tensiometer based soil moisture sensor. It consists of a cylinder with piston connected to the tensiometer and a 6V DC battery and a 6V relay. The cylinder with a spring-loaded piston is connected to a piston rod. There are two brass strips, one connected to the cylinder and the other connected to the piston.

A gap is maintained between the two strips, which is bridged when they move closed due to the suction created by the change in soil moisture. One of the brass strips is connected to the (-ve) end of the battery and the other brass strip is connected to the other (+ve) end of the battery through the 6V relay, motor of the pump and a switch.

Advantages

It is a simple, effective and versatile device, which can be easily adopted by the ordinary farmers. It maintains pre-defined soil moisture content by actuating and deactuating the motor of the pump automatically. The energy consumption is very low.

Applications

This can be used for automation of micro irrigation system, such as microsprinkler and drip.

Target countries

Developed and developing countries where micro irrigation system is used.

Collaboration Options

Technology Transfer

Organisation

Indian Institute of Technology, Kharagpur

Specifications

Inputs Required

Information on the level of soil moisture content conducive to the required crop/cropping system

Raw Materials

A small porous cup, a small cylinder with piston, a 6V battery and a 6V relay.

Cost per Unit

Each unit will cost about Rs. 250/-

Motorised Knapsack Mist Blower cum Duster

Description

Blower cum Duster is equipment used for effective and quick application of pesticides in liquid and dust forms. It is driven by a petrol or kerosene engine. Some of the unique features are:

- Fiberglass blower casing in one piece
- Cannon type lance with tilting system enables to adjust blower direction
- Stainless steel impeller mechanically balanced
- Light weight, air cooled, four stroke villers mark 25 HP engine
- Microniser nozzle most suitable for spraying oil based copper fungicides
- Microniser nozzle most produces uniform fine droplets of 150 to 200 microns by spinning action
- Rotary pump to feed the microniser nozzle and create agitation in the chemical tank

Advantages

The Mist Blower has the following advantages:

- Compact design and sturdily built unit
- Bigger chemical tank
- Bigger filler hole & strainer for no filling of spray solution
- Plastic rotor for better performance

Applications

The Mist Blower is used for spraying in orchards, tea gardens, coffee estates and other field crops.

Target Countries

Africa, Middle East and Asian countries

Collaboration Option

Marketing and Sales Agreement

Organisation

American Springs and Pressing Works Pvt. Ltd



Specifications

- Dynamically Balanced Aluminium Rotor
- Back Cushion and Padded Shoulder Strap
- Air Velocity-249ft/sec
- Air Output-4.15 ft/sec
- Volume-.117 cubic meter/sec
- 1.2 HP Petrol /Kerosene Engine
- Engine available: Greaves L/34, High Power HP/35 and Ralli L/35

Pesticide Sprayers

Description

Manual Knapsak Sprayers

These are pesticide and weedicide sprayers for all kinds of field crops. They are available in multiple variants. The tank capacity is 13/16 litres. The tanks come with Brass/Plastic pump and nozzle. Shoulder straps attached to the tank are made of cotton and nylon.

The discharge rate of the fluid varies from 250-1300 cc/minute. The Knapsak have easily adjustable right/left handed operation.

ULV Sprayers

ULV Sprayers are electrically operated ultra low volume sprayer used for pest control in all crops especially in nurseries and green houses. They develop ultra low volume (ULV) droplets in the range of 5-50 microns, which penetrate into cracks and crevices for controlling insects in their natural hiding place.

Power Sprayers

These are Piston Power Sprayers for spraying of pesticides and weedicides.

It has stainless steel valve box, suction and delivery. It is made out of brass forging and industrial quality material. 4 to 6 Spray guns can be used at a time for faster coverage. It is available in different variants.

Advantages

The Manual Knapsak sprayers are economical, robust and sturdy. They have a corrosion resistant plastic tank base and chemical resistant PVC pistons and washer. These are user friendly products which are re-usable and have a product Life of 10-15 years.

The advantages of ULV Sprayers are:

- Light weight and portable
- Easy to handle
- Totally silent and trouble free operation
- Effective coverage with less spray solution
- No visible trace of spray solution resulting in clean environment

Power Sprayers have the following advantages:

- Bigger chemical tank
- Heavy duty and efficient in any field condition
- Compact and light weight
- Sturdy and rugged construction
- Portable
- Economical

Applications

Manual Knapsak sprayers finds application in pesticide and weedicide spraying in all field crops.

ULV Sprayers finds application in factories, hotels, housing societies, hospitals, godown and warehouses.

The Power Sprayer is used for spraying in

- Vineyards
- Coffee plantations
- Rubber plantations
- Orchards
- Other field crops

Target Countries

Africa, Middle East and Asian countries

Collaboration Option

Marketing and Sales Agreement

Organisation

American Springs and Pressing Works Pvt. Ltd

Specifications of ULV Sprayers

Type	Electrically Operated Power Sprayer
Chemical Tank Capacity	4 litres
Chemical Output	2000cc/hr
Discharge Capacity	0 to 2 litres/hr
Throw	10- 15 meters
Area of Coverage	2500 m ² /hr (meter cube)
Fog Particle Size	0.5 to 50 microns
Weight	2.6 kg (empty)

Specifications of Power Sprayers

Description	HTP	HDP	HSP	Senior HTP	Junior HDP
Power- HP	3	3/2	1	10	2
No. of Piston	3	2	1	3	2
Suction Capacity-LPM	36	24/13	12	100	14
Maximum Pressure- PSI	400	400	400	600	400
Pump Revolution- RPM	950	950	950	600	950
Weight without Pulley and Oil-kgs	12	9.6	6.7	58	7.4

HTP: Horizontal Triplex Piston Pump Sprayer / HDP: Horizontal Doplex Piston Pump Sprayer

HSP: Horizontal Single Piston Pump Sprayer



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