



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

TECHNIQUES IN PLANT PROTECTION MSH-304

LECTURE 10**PROBLEMS OF MAINTENANCE AND REPAIRS OF PLANT PROTECTION EQUIPMENT**

Plant protection machines in general are not well maintained regularly either in godowns/ depots where they are stored or in the field where they are used. Life of a machine depends entirely on its care and maintenance. Even though machines are made with high standards of skill and workmanship, they can easily be ruined due to improper care and maintenance. Good and constant performance from machines can be obtained only when they are used and serviced periodically. The purpose of maintaining a machine is for increasing the useful life of the machine and to be available in working order whenever put to use. The maintenance of a machine involves proper care, operation, servicing, repair and keeping it in good working order.

MAINTENANCE:

Normal maintenance jobs include cleaning the equipment and applying necessary lubricating oils and greases to the rubbing and moving parts. If this normal maintenance is neglected the machine gets rusted and moving parts wear out quickly resulting in loss of efficiency, frequent replacement of spare parts and finally uneconomical working. Besides the normal maintenance as above, special care has to be taken for maintaining the plant protection equipment. The pesticide formulations are chemically aggressive on metals, etc. The cleaning and washing of the chemical tank, discharge lines, nozzles, etc., are to be done regularly after the day's spraying work is completed otherwise the residues of chemicals used for spraying acts on the parts and causes corrosion and deterioration of materials. If this aspect of thorough cleaning is not done on the plant protection machine, even though it is made of with high standard materials, it will not serve its normal life and would lead to premature condemnation.

MAINTENANCE JOB FOR HAND OPERATED EQUIPMENT: 1.

Cleaning the chemical tanks, hoses, valves and nozzles etc. and flushing sufficiently to avoid pesticide residue which is corrosive. 2. Cleaning the machine equally well from outside also as it

is contaminated due to leakage, spilling of pesticide. 3. Lubricating suitably the pump parts like piston, cylinder, valves and other rotating, sliding, moving parts. 4. Store the machine in dry place duly protected from sun and rain.

MAINTENANCE JOB FOR POWER OPERATED EQUIPMENT:

All the above maintenance jobs apply to power equipment also. But the engines have to be taken care of specially. The life and efficiency of the engine mostly depends upon proper maintenance. For their running all engines need fuel, air and proper system of ignition. Thus in petrol engine, clean petrol, clean air and healthy ignition (spark plug & magnets) are essential. Besides those, the engine need perfect lubrication, too. In two stroke petrol engine, care must be taken to mix lubricating oil and petrol in exact ratio as recommended by engine manufacturer. Similarly in four stroke petrol engine the lubricating oil should be kept in sufficient quantity by observing the level gauge. The air cleaner should be cleaned occasionally. The spark plugs should be also cleaned, carbon removed and proper electrode gap should be maintained. The 2-stroke petrol engines used in low volume spraying should invariably be in good order otherwise the pesticide spraying will not be efficient. Sufficient care should be taken at the depots to clean, oil and check equipment periodically when they are stored, and whenever machines are sent out to work, and when returned from field work. This minimum care to inspect the equipment, clean and flush and keep it duly oiled, would go along way in improving the availability of good working sprayers and dusters and also prolonging their useful life.

REPAIRS AND REPLACEMENTS:

The plant protection equipment is often found requiring frequent repairs and replacements which are both minor and major in nature. Due to this, a good number are found sick in the depots. Hand operated equipment generally need minor repairs such as replacement of plunger washers, springs, nozzle etc., and these repair could as well be attended to by the operators themselves with little training and experience. It is essential to supply them necessary spare parts and tools well in time for repairing. In the case of power operated sprayers the engine repairs are classified into minor and major ones. 1) Minor repairs : Spark plug cleaning and adjustment, air cleaner,

carburetor cleaning, fuel cock and lines cleaning and starter repairs, etc. These can be attended to by the operators themselves with little experience and training. 2) Major repairs: These repairs include replacement of parts like piston, rings, liners, crankshaft, bearings, valves, etc. These repairs have to be carried out systematically in well equipped workshops by the competent and trained mechanics. Untrained personnel should not be allowed to handle such major repairs.

SUGGESTIONS ON MAINTENANCE

In order to improve the present situation the following suggestions are made: 1. Plant protection equipment manufacturers, their dealers, State agril. Engineering workshops and extension officers need better coordination & cooperation to reduce the number of sick equipment. 2. The field operating staff needs orientation training to be given on maintenance, repairs, operations and calibration of equipments on periodic basis. 3. Adequate number of mechanics and supervisory staffs has to be posted for maintenance and repairs of the equipment. 4. A district-wise service station, properly equipped, could cater to major repairs on power operated equipment within its zone.