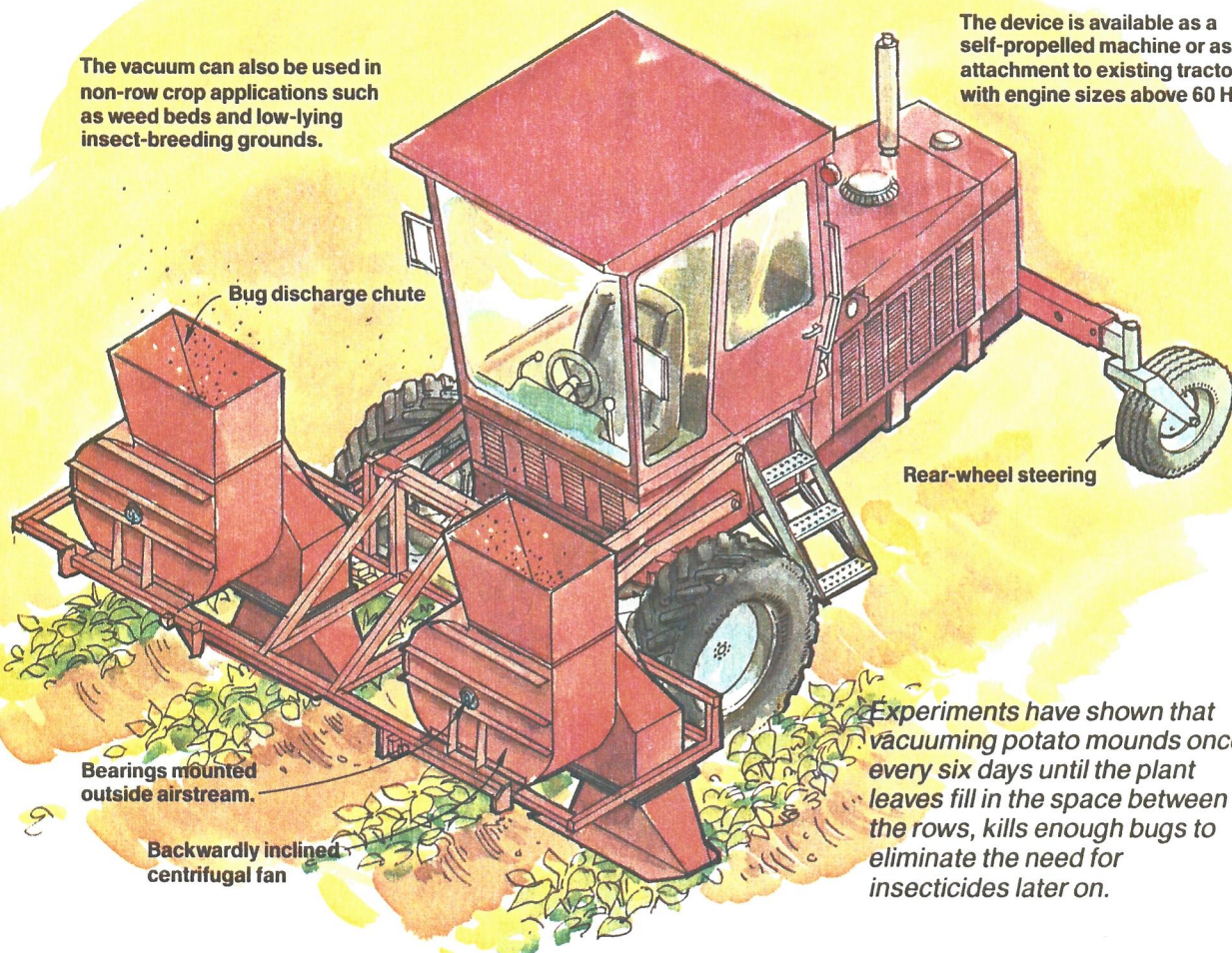


CROP VACUUM DECREASES NEED FOR INSECTICIDES

Farm implement ensures pest-free crops.

The vacuum can also be used in non-row crop applications such as weed beds and low-lying insect-breeding grounds.

The device is available as a self-propelled machine or as an attachment to existing tractors with engine sizes above 60 Hp.



Experiments have shown that vacuuming potato mounds once every six days until the plant leaves fill in the space between the rows, kills enough bugs to eliminate the need for insecticides later on.

A recently introduced machine that vacuums bugs off crops promises to eliminate or reduce a farmer's dependence on insecticides. The crop vacuum consists of large fans mounted on a tractor. The fans suck bugs and their larvae off the leaves. The insects are killed when they hit deflector plates or the fan impeller. Dead bugs are blown out to the field through a discharge chute.

The crop vacuum, called Bug-buster, from Industrial Air Products Inc., Phillips, Wisc., can be used on any crop. How well the machine controls insects depends on

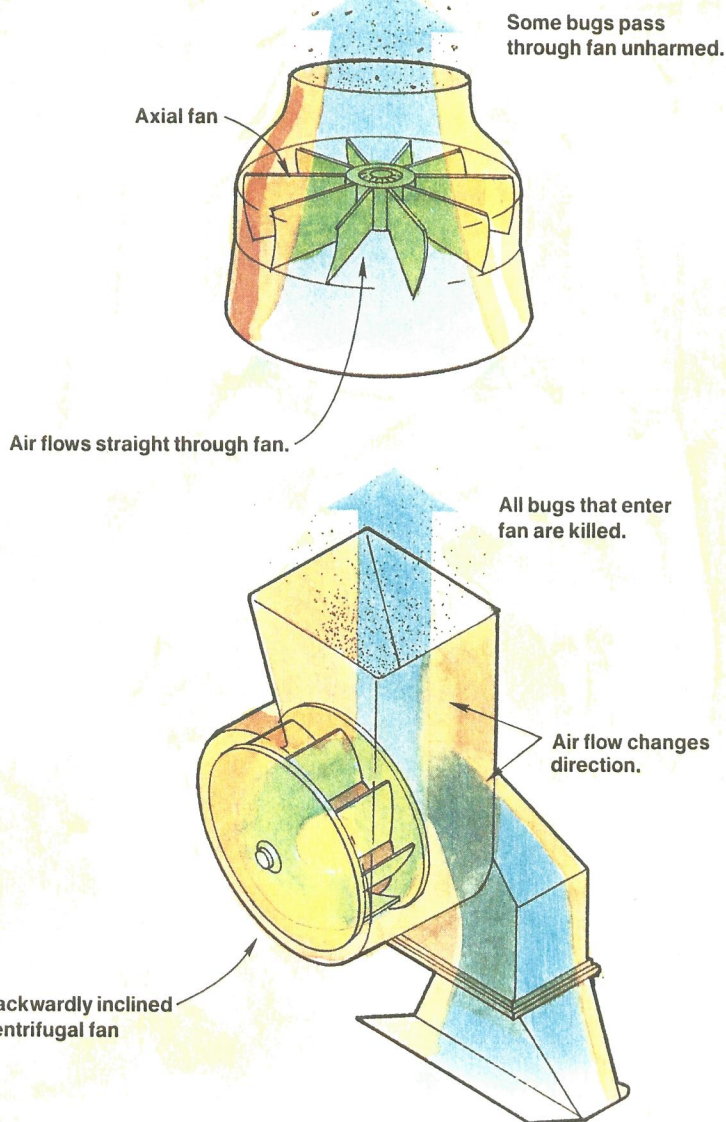
plant type, stage of growth, topography, climate, and type of insect. Initial data shows that for many crops, the vacuum has the same or better kill rate as chemicals. Recently it has been used to rid potato crops of beetles that have developed a resistance to insecticides.

In operation, Bug-Buster uses two, three, or four backwardly inclined centrifugal fans, with each fan vacuuming two crop rows. The fans are mounted on the front of the tractor so the noise from the tractor engine will not scare the bugs away before the vacuum can get to them. The fans are installed

horizontally, with airflow into the fan parallel to the ground. As airflow changes direction in the system, bugs are forced onto a deflector plate. Live bugs that pass the deflector have a chance to hit another plate just before entering the fan at 65 mph. Any remaining bugs are sheared by the 10-blade impeller which rotates at 2,100 rpm.

Other crop-vacuums systems are not as effective at killing bugs because they use axial fans mounted vertically. With these fans, air flows perpendicular to the ground. Axial fans are designed to

Types of fans



push air through and so are not as likely to shear the bugs. And since the air does not change direction, bugs are more likely to pass through the blades unharmed. Other systems use a collector bag on the discharge chute to catch live bugs, while the Bug-Buster does not.

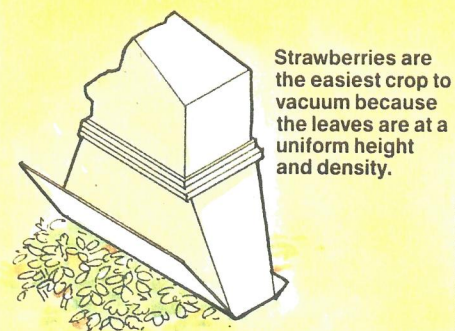
In addition to a high kill rate, Bug-Buster is designed for long life. The fan's bearings are outside the housing and not in the air stream, as with other systems. Thus, twigs, dirt, and bugs will not contaminate the bearing, decreasing its life. And since the fan is mounted horizon-

tally, bearing stress is minimized, which also increases service life. With the vertical arrangement used in other vacuums, it is more difficult to balance the load on the bearings, so they wear more quickly and are more difficult to keep lubricated.

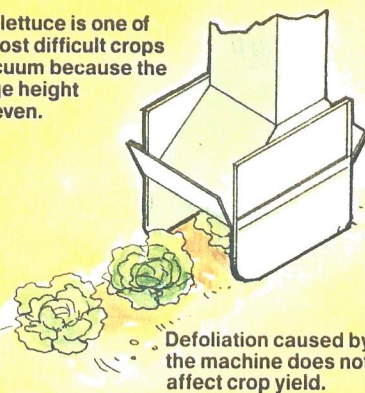
The impeller in the Bug-Buster is made of aluminum because of its durability, corrosion resistance, and light weight. Other systems use steel fans, which corrode, or plastic, which is not as strong. Farmers are also concerned with soil compaction, so aluminum helps keep system weight down. **CIRCLE 452**



The need for alternatives to insecticides is growing as chemicals are increasingly finding their way into groundwater, and because the health effects of chemicals on fruits and vegetables is not fully understood.



Head lettuce is one of the most difficult crops to vacuum because the foliage height is uneven.



Leaf density and height uniformity determine inlet-hood shape. When foliage grows at a uniform height and density, insects tend to be evenly concentrated the same distance from the hood. The vacuum is also more effective when it is drawn over evenly dense surface areas.