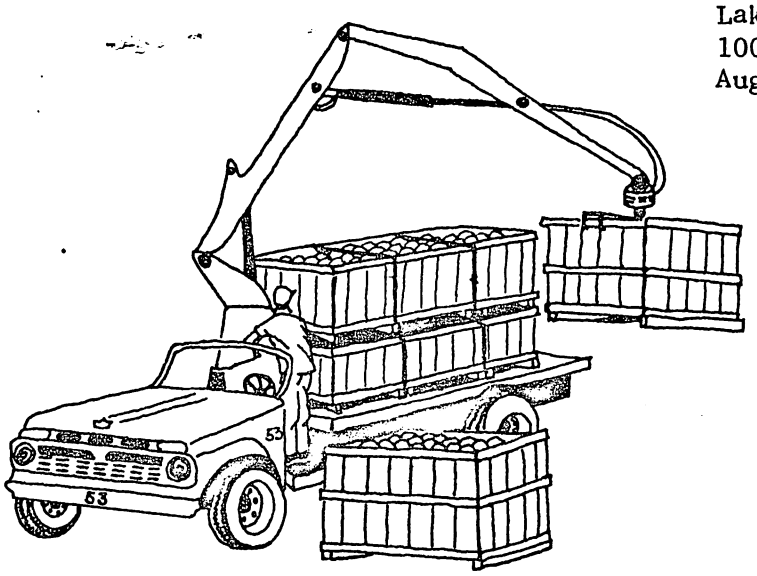
Newsletter #56

(*-*)
Lake Alfred AREC Research Report-CS73-8
1000 copies
August 17, 1973



Editor: W. F. Wardowski
Harvesting and Handling Section
University of Florida
Agricultural Research and Education Center
P. O. Box 1088
Lake Alfred, Florida 33850

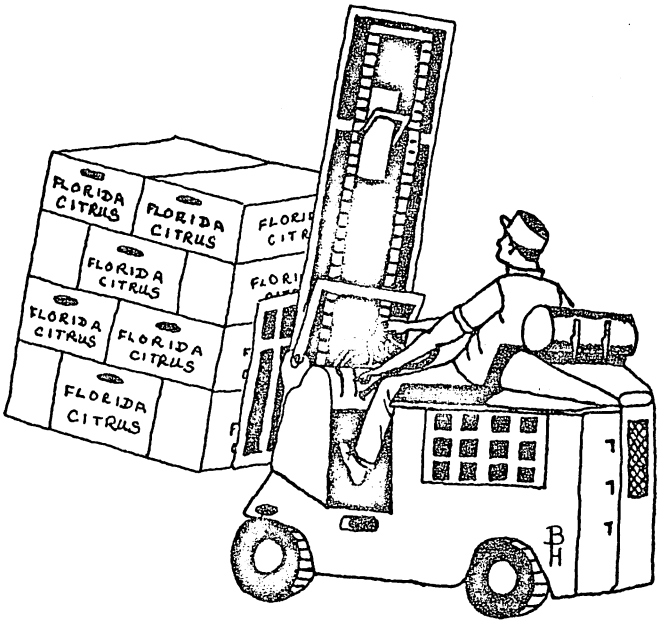
Packinghouse Newsletter

UNIVERSITY OF FLORIDA INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES

and

STATE OF FLORIDA, DEPARTMENT OF CITRUS

*Anyone wishing to receive this newsletter may send a dozen stamped, preaddressed envelopes to the above address.



(*-*)
Lake Alfred AREC Research Report-CS73-8
August 17, 1973-WFW-1000

Harvesting and Handling Section

P A C K I N G H O U S E N E W S L E T T E R

EMISSIONS CONTROL FOR INTERNAL COMBUSTION-ENGINE LIFT TRUCKS

Users of internal combustion-engine (I.C.E.) powered lift trucks may be confused about their responsibility for controlling gaseous emissions in inside work areas. OSHA limits are on the amount of harmful elements in the air that workers breathe.

Representative OSHA exposure limits in terms of contaminant levels for work area air (maximum eight-hour time-weighted averages), are shown in parts per million (ppm) in a table below.

Statistics on I.C.E. powered lift trucks without emission-control devices (engine displacement 140 cu. in. or more) suggest ranges of contaminants found in the exhaust emissions, also shown in the table.

To control emissions from the truck, regular maintenance is vital. However, it might be impossible, depending upon the conditions of the plant area, to control exhaust emissions sufficiently to maintain acceptable work area air without the use of "low-emission" equipment. Use of this equipment can give average results as shown in the table below.

Constituent	Work Area Air OSHA Limits	Truck Exhaust Emissions			
		Without Low-Emission Equipment		With Low-Emission Equipment	
		Gasoline	LP-Gas	Gasoline	LP-Gas
	ppm	ppm	ppm	ppm	ppm
Carbon monoxide	50	16,000-93,000	1000-107,000	7000	4000
Nitrogen dioxide	5	800	1000	1000	1000
Hydrocarbons (formaldehyde)	3	400-2300	20-2500	250	150

One manufacturer has reported that catalytic converters used on LP gas or gasoline-fueled trucks can cut engine emissions by as much as: 96.5 percent of carbon monoxide, 87 percent of hydrocarbons, 95 percent of smoke, and 99 percent of odor. Effectiveness in noise reduction can be equal to a standard acoustical muffler. The useful life of a catalytic converter is said to be as much as 3,000 hours with LP gas, 1,500 hours with lead-free gasoline and 500 hours with leaded gasoline (on a properly tuned engine). These useful life figures have often been exceeded by thousands of hours.

Finally, on how to control the quality of the work place air, the article states that one basic problem is to come up with the right ventilation rates to dilute and remove the carbon monoxide generated by I.C.E. powered lift trucks. A study of the variables relating to ventilation requirements in plant operations showed the factors in the dilution and removal of carbon monoxide were: 1) natural ventilation, 2) mechanical ventilation, 3) the distribution of air flow, 4) room volume per truck, and 5) the operation area.

Under no circumstances should an I.C.E. lift truck be operated in less than 25,000 cu. ft. of space.

The required ventilation rate has been calculated to be about 5000 cfm per propane-fueled truck and 8000 cfm per gasoline-fueled truck. However, substantial adjustments usually must be made in any suggested ventilation rates to compensate for conditions in individual plants. For example, it is indicated that ventilation rates should be tripled in plants that have no regular lift truck maintenance program.

A wide variety of instruments is available from manufacturers of gas analysis equipment. The most common chemical type uses colorimetric indicator tubes which change color or provide a length of stain that can be measured to determine the gas concentration. Such indicator tube equipment is often used for quick checks, after which, when a given tube indicates a significant concentration, a follow-up test is made, using a more precise method of analysis. Individual colorimetric tubes are relatively inexpensive, expendable devices -- not precision laboratory equipment.

NOTE: Before undertaking any changes in connection with OSHA requirements, managers should obtain complete details of the applicable OSHA directions.

Condensed by
Earl Bowman, USDA/ARS Gainesville
from "Emissions Control--What OSHA Requires--Controlling Truck Emissions--Controlling the Workplace Air", Modern Materials Handling 27(11):49-60.

WARDOWSKI ELECTED CHAIRMAN

Word gets around in the produce world and people ask if Alfred Wardowski, Leslie, Michigan, is related to this citrus Extension agent. You bet--he's my father. Al Wardowski also gets around as fruit grower, County Commissioner, member of the International Apple Institute, and recently elected chairman of the Michigan Apple Committee. The Michigan Apple Committee operates on a similar basis to the Florida Citrus Commission.

Congratulations, Dad!

W. Wardowski
Extension Service

CITRUS PACKINGHOUSE DAY

Wednesday, September 5, 1973

Agricultural Research & Education Center, Lake Alfred

Registration 8:30 A.M.

Program (see last Packinghouse Newsletter) 9:10 A.M. to 2:50 P.M. including equipment demonstrations during lunch period

Equipment Demonstrations:

- Plastic Pallet Boxes
- Mechanized Tray Packing
- Degreening Room Fog Humidification System
- Noise Reduction for Metal Chutes
- Nylon Net Bagging Machine

AVAILABLE PUBLICATIONS

Available from Union Carbide Corporation, Educational Aids Department, Box 363, Tuxedo, New York 10987.

English-Metric Conversion Calculator and folder explaining origins of the two systems. Conversions in length, area, weight, mass, volume, and temperature can be made with this slide rule-type device. Cost: $2.50

This public document was promulgated at an annual cost of $201.60, or two and one-half cents per copy to inform county agricultural directors, ranchers, and growers of research results in harvesting and fresh fruit handling and marketing.