AGENCY FOR INTER ATIONAL DEVELOPMENT
WASHINGTON, D C 20523
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY
Batch 93

1 SUBJECT CLASSIFICATION

A PRIMARY
Food production and nutrition — AN00-0000-G430

B SECONDARY
Farm machinery and buildings--USA

2. TITLE AND SUBTITLE
Rice drying technology and equipment which might be applicable to tropical developing countries

3. AUTHOR(S)
Hodges,T.O.

4. DOCUMENT DATE	5 NUMBER OF PAGES	6 ARC NUMBER
1969	47p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS
Kan.State

8 SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*
(In Food grain drying,storage,handling,and transportation rpt.no.1,rev.)

9. ABSTRACT

10. CONTROL NUMBER
PN-AAG-112

11. PRICE OF DOCUMENT

12. DESCRIPTORS
Drying
Intermediate technology
Rice
Tropics
USA

13. PROJECT NUMBER

14. CONTRACT NUMBER
CSD-1588 GTS

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

Food Grain Drying, Storage, Handling and Transportation

Report No. 1
Revised September 1969

Rice Drying Technology and Equipment which might be applicable to Tropical Developing Countries

FOOD & FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY

MANHATTAN, KANSAS 66502

Prepared by

Prof. T. O. Hodges

for the
AGENCY FOR INTERNATIONAL DEVELOPMENT

AID/csd-1588
Technical Assistance in
Food Grain Drying, Storage, Handling and Transportation

at the
FOOD AND FEED GRAIN INSTITUTE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

Dr. William J. Hoover, Director
Dr. T. O. Hodges, Agricultural Engineer
John R. Pedersen, Entomologist

Rice drying technology and equipment which might be applicable to tropical developing countries.

TABLE OF CONTENTS PAGE NOS.

Figures

List of U.S. companies which manufacture grain handling, drying, storage and/or processing equipment.

RICE DRYING TECHNOLOGY AND EQUIPMENT IN THE UNITED STATES WHICH MIGHT BE APPLICABLE TO TROPICAL DEVELOPING COUNTRIES

GENERAL DISCUSSION

The market value of rough rice is determined largely by the percentage of whole grain milled rice that can be obtained from it. In turn, milling quality and thus price is affected greatly by drying procedures. The problems encountered in drying rough rice are similar to those in drying other cereal crops, but rice requires a more exacting drying treatment than is needed for most grain crops. This is because a premium is placed on merchandizing milled rice as whole kernels. Improper drying causes internal stresses in kernels of rough rice that result in breakage when the rice is milled.

While most of the rice in the United States is dried in large dryers, it seems logical to believe that the same principles and equipment on a small scale would be applicable for community and/or custom (possibly moving from village to village) operations in many of the developing countries. It should be emphasized, however, that the discussion here is based upon United States conditions and that people on the site in question would have to judge applicability at specific localities.

The purpose of this paper is to report some of the latest U. S. technology in rice drying with lists of suppliers of equipment for carrying out the required drying.

METHODS OF RICE DRYING

Generally, the best quality rice is harvested at moisture contents between 16 and 24 percent. Since maximum moisture content for safe

storage is about 12 to 13 percent or perhaps a little lower in tropical climates, some form of drying after harvest is required. While the required drying can be accomplished by spreading the grain in thin layers on a drying floor and exposing it to the sun, as is done in some of the developing countries, the techniques used in the United States utilize the forcing of air through the rice mass. The three rice drying methods most widely used are: (1) heated air drying, (2) unheated air drying, and (3) drying with low temperature air, frequently referred to as drying with supplemental heat.

HEATED AIR DRYING

Heated air drying is the use of forced ventilation with the addition of large amounts of heat for removing moisture. This can be done either in a continuous flow dryer as shown in Figure 1, or in a batch dryer as shown in Figure 2A. Heated air drying, however, is not generally recommended for drying deep depths of rice since, if improperly managed, it results in overdrying the bottom part and may cause spoilage in the upper layers of the rice. While most commercial rice drying is done with continuous flow dryers by forcing large volumes of heated air through thin layers of rice (4-10 inches thick), batch driers can be quite satisfactorily used at the farm or village level.

CONTINUOUS FLOW DRYERS

Continuous flow rice dryers operate generally by putting rice in at the top of a column as shown in Figure 1, and then discharging it from the bottom. Air at relatively high temperatures is forced through the grain column as the grain moves downward through the drier. The rate of grain movement is controlled by a variable speed discharge unit shown

at the base. There are two different procedures in current use. In the first method, air heated at approximately 110° - 120° F. is passed through a continuously moving column of rice in three or more passes. This is known as the multi-pass system. During the first pass, a predetermined amount of moisture is removed from the rice, after which the rice is stored temporarily. After the rice is stored temporarily, perhaps a day or so, it is then passed back through the dryer for more moisture reduction. This process is continued till the grain has been brought to a safe storage level. Most of the rice produced in the United States and dried commercially is dried by the multi-pass method.

In the second system air is heated to around 110° F. and then passed continuously through the column of rice in one operation till the moisture content of the grain is reduced to average storage level. The method of delivering dry air through the grain column and the mapping of grain in the columns varies between dryers by different manufacturers.

Column dryers can be purchased commercially in many capacities varying from around 50 bushels per hour up to 5,000 or more bushels per hour. The smaller units can be purchased in stationary or movable units. The movable units might offer some possibility for use in moving from village to village in developing countries on a custom basis. In the multi-pass drying system, the procedure generally is to store the rice for a few hours after each drying pass. This period is called a tempering period in which the moisture within the kernel comes to equilibrium throughout the kernel, thus preventing overdrying of the outside surface which results in stress cracks.

Recent research has shown that more efficient drying and an increase in rice quality can be obtained by aerating the rice between drying passes. In order to remove the moisture that is readily evaporated while cooling with aeration and thus improving overall drying efficiency, rice should remain in an aeration bin long enough for all of it to be cooled to near outdoor air temperature. The time required for cooling a bin of rice depends on the air flow rate and the amount of moisture evaporation taking place. The latter depends upon air temperature and relative humidity and rice temperature and moisture content. This cooling time varies somewhat even if the air flow rate is constant. As a rule of thumb, if one expects to use no more time than twenty-four hours between dryer passes, then an air flow rate of about one c.f.m. per barrel will be required. Increasing the aeration air flow rate would decrease storage time, while on the other hand, decreasing the rate would increase storage time between passes.

The cost of continuous flow dryers unassembled in the United States varies from about fifteen dollars ($15) per bushel per hour capacity for the large dryers up to fifty or sixty dollars ($50 or $60) per bushel per hour capacity for the small unit. As is seen, the per bushel cost increases as the capacity is reduced. To these costs, one would need to add cost of elevating equipment, installation costs, shipping cost, and etc.

BATCH DRYERS

Batch drying is use of a bin, usually round, in conjunction with a fan and heater such as shown in Figure 2A. A batch of high moisture grain is placed in the bin, to a depth of about two to four feet and large quantities of air, usually about from 30 to 100 c.f.m. per

bushel at high temperature (about 110° to 140° F.) are passed through the grain until the grain has reached the desired moisture content. The grain is then cooled until it is just a few degrees above ambient air temperature by operating the fan with no heat. The grain then is removed from the drying bin, and the bin is reused for succeeding batches. This method is quite successful for drying corn or soybeans, and although not the most successful method, it could be used for drying rice. If used for rice, the method would be slow because of the need for periodic minute decreases in grain moisture content followed by tempering periods either with or without aeration. Low quality rice would result from rapid single-stage drying. If daily quantities of rice are small, it is possible, however, to utilize batch drying for rice.

SUPPLEMENTAL HEAT DRYING

Drying with supplemental heat is the same as drying with unheated air except that a small amount of heat is added to the drying air to lower the relative humidity during periods when the atmospheric air has a high relative humidity. Temperature rise of the drying air usually is limited to less than 20° F. Supplemental heat drying can be done in round bins with perforated floors or other methods of distributing air through the grain, (Figure 2A, B, C, D). Many other arrangements could be used for distributing the air through the grain. These are typical methods of those that are used.

Supplemental heat drying can be used in either single loading or in multi-layer loading of a bin. For purposes of illustrations, consider the use of a round bin as shown in Figure 2A.

SINGLE LOADING

In single loading, the rice is placed in a bin to a depth of about 8 to 10 feet, or to a maximum as recommended by the manufacturer for the equipment in use. For maximum depths of grain in the bin, the upper limit of grain moisture is about 20 percent.

In supplemental heat drying of deep beds of rice with single loading, the heater controls are set to give about a 10 to 12° F. temperature rise of drying air above that of ambient air. This rise will reduce the relative humidity of even saturated air to a level which provides adequate drying potential (50 to 60% R.H.). The upper limit for drying air temperature is 105° to 110° F., with the lower figure being preferred. When ambient relative humidity is below about 60 percent, supplemental heat is usually not required.

Commercial storage units are available for many sizes and types of installations for supplemental heat drying. Typical types of units are shown schematically in Figure 2. The units are readily available in capacities of about 1,000 to more than 100,000 bushels for storage purposes, with single loading drying limited by bin size, fan and heater size, grain moisture content and depth. U. S manufacturers supply complete operating instructions and limitations on use of their equipment. As a rule of thumb, in supplemental heat drying, minimum air flow rates are about 2 1/2 c.f.m. per bushel.

The prices of supplemental heat dryers vary with type and capacity of system. As capacity increases, price decreases. For example, a 1,000 bushel unit (bin, fan, heater, and controls) will cost approximately $0.90 to $1.00 per bushel while a 4,000 bushel unit is about $0.50 per bushel, F.O.B. factory. To these costs, one would need to add conveying

equipment, if needed, plus inland freight, crating for overseas shipment, insurance, and erection costs. Depending on the overseas locality, the items above, less conveying equipment, could increase the F.O.B. prices from 50 to 100 percent.

MULTI-LAYER LOADING

The same type of equipment is used for multi-layer loading with in-storage drying as was described for single loading. The advantages of multi-layer loading are: (1) more uniform drying of the grain, (2) higher permissible initial grain moisture (up to 30 percent), and (3) greater final grain depth in a particular bin depending on initial grain moisture. Final depths greater than 20 feet can be used if grain moisture does not exceed 20 percent, while depth is limited to about 11 feet if grain moisture is 30 percent.

In this method, wet grain is added to a specified depth, dried and then another layer of wet grain is added on top of the dry, etc. until the bin is filled and drying is complete. The depths, of course, are governed by matching equipment capacities to drying requirements. Assume for example, that rice at 25 percent moisture is to be dried in layers to 12 percent moisture with supplemental heat resulting in a rise in air temperature of 12° F., with a stipulation that maximum air temperature is 105° F. Under these conditions, the maximum safe final depth is 16 feet and rice would be added in layers not to exceed five feet.

As in all grain drying operations, it is important to cool the rice after drying is completed.

Costs of this type of system are similar to those for single loading ones.

UNHEATED-AIR DRYING

Unheated-air drying, as the name implies, is simply the forcing of ambient air through a grain mass in order to dry the product to a safe moisture content for storage. The procedures and equipment, without heater, are generally the same as used for supplemental-heat drying. Costs of equipment, without heaters, would be slightly less since the heater cost would be excluded.

It is important to recognize that air conditions (temperature and relative humidity) are quite variable in most areas of the world. This makes unheated-air drying somewhat unpredictable and requires the user to use good management. When relative humidity exceed about 70 percent, dry rice (12-13 percent) will gain moisture. Even though an upper layer of wet grain in multi-layer loading might be drying with this humid air, that grain previously dried in the bottom of a bin would be rewetted. Therefore, for humid areas, it seems desirable to have the capability of supplying supplemental heat to natural air when conditions require it. Studies in Texas by Sorenson and Crane (12), showed that rice suffered excessive "heat damage" when the moisture content in the wettest layer of rice at temperatures of 80° to 86° F. remained above 15 percent for 8 to 10 days. They found that under Texas coastal conditions, the moisture in the wettest layer of rice at temperatures of 70° to 75° had to be reduced below 16 percent in 15 days, or less, to prevent grade loss from discolored kernels. Minimum air-flow rates recommended were 2 1/2 c.f.m. per bushel.

Unheated-air drying of rice is questionable for areas with extended periods of relative humidities greater than 70 percent. In such locations, supplemental heat sources should be included.

HEAT SOURCES

In the United States, the two major fuels used in heated-air and supplemental-heat drying are gas, both natural and LP, and fuel oil. Obviously, other sources may be required in some of the developing countries. Since only a small temperature rise, about 12^{o} F., is required to reduce saturated air to between 50 and 60 percent relative humidity, it appears that solar heat should be considered as a likely source for grain drying in tropical climates. The possibilities may be most practical for small in-storage drying operations. Solar heat collectors could be an integral part of the bin, as described by Buelow (2), and Thierstein (14), or a separate inexpensive collector as described by Robertson and Mowry (11).

SELECTED REFERENCES

Agricultural Engineering Research Division, Agricultural Research Service. You Can Store Grain Safely on the Farm. Farmer's Bulletin No. 2071. United States Department of Agriculture. Washington, D. C.

Buelow, F. H. Drying Grain with Solar Heated Air. Quarterly Bulletin. Michigan Agricultural Experiment Station. Michigan State University, East Lansing, Michigan. November, 1958.

Calderwood, David L. and Reed S. Hutchinson. Drying Rice in Heated Air Dryers with Aeration as a Supplementary Treatment. Marketing Research Report No. 508. U.S.D.A. and Texas Agricultural Experiment Station. Washington, D. C. November, 1961.

Calderwood, David L. and Foris J. Louvier, Jr. Procedures For Increasing Drying Capacity of Commercial Rice Dryers. The Rice Journal. July, 1964.

Dachtler, W. C. (Editor). Research on Conditioning and Storage of Rough and Milled Rice. A Review through 1958. Agricultural Research Service, United States Department of Agriculture. ARS 20-7. November, 1959.

Davis, C. P. and R. I. Lipper. Solar Utilization for Crop Drying. United Nations Conference on New Sources or Energy. April, 1961.

Hutchinson, Reed S. and E. F. Willms. Operating Grain Aeration Systems in the Southwest. Marketing Research Report No. 512. Agricultural Marketing Service, U.S.D.A., Washington, D. C. April, 1962.

McNeal, Xzin. Rice Aeration, Drying, and Storage. Bulletin 593. Agricultural Experiment Station, University of Arkansas, Fayetteville, Arkansas. October, 1957.

McNeal, Xzin. Rice Storage: Effect of Moisture Content, Temperature and Time on Grade, Germination and Heat Rice Yield. Bulletin 621. Agricultural Experiment Station, University of Arkansas, Fayetteville, Arkansas. February, 1960.

McNeal, Xzin. Effects of Drying Techniques and Temperatures on Head Rice Yields. Bulletin 640. Agricultural Experiment Station. University of Arkansas. Fayetteville, Arkansas. April, 1961.

Robertson, K. E. and G. R. Mowry. Solar Heat Aids Grain Drying. Sun at Work, Volume VIII. No. 4, Fourth Quarter. 1963.

Sorenson, J. W. and L. E. Crane. Drying Rough Rice. B-952, Texas Agricultural Experiment Station. College Station, Texas. March, 1960.

Stover, Harold E. Grain Drying with Forced Air. Electrification 12, revised. Kansas Extension Service. Manhattan, Kansas. November, 1965.

Thierstein, Gerald E. Design of a Cone-Shaped Solar Collector. Unpublished Report. Department of Agricultural Engineering. Kansas State University. Manhattan, Kansas, 1961.

Selected References Continued

Traylor, H. D., C. Price and C. B. Markeson (1967) Costs of Drying and Storing Rough Rice in Louisiana and Texas U.S.D.A., Marketing Research Report No. 799.

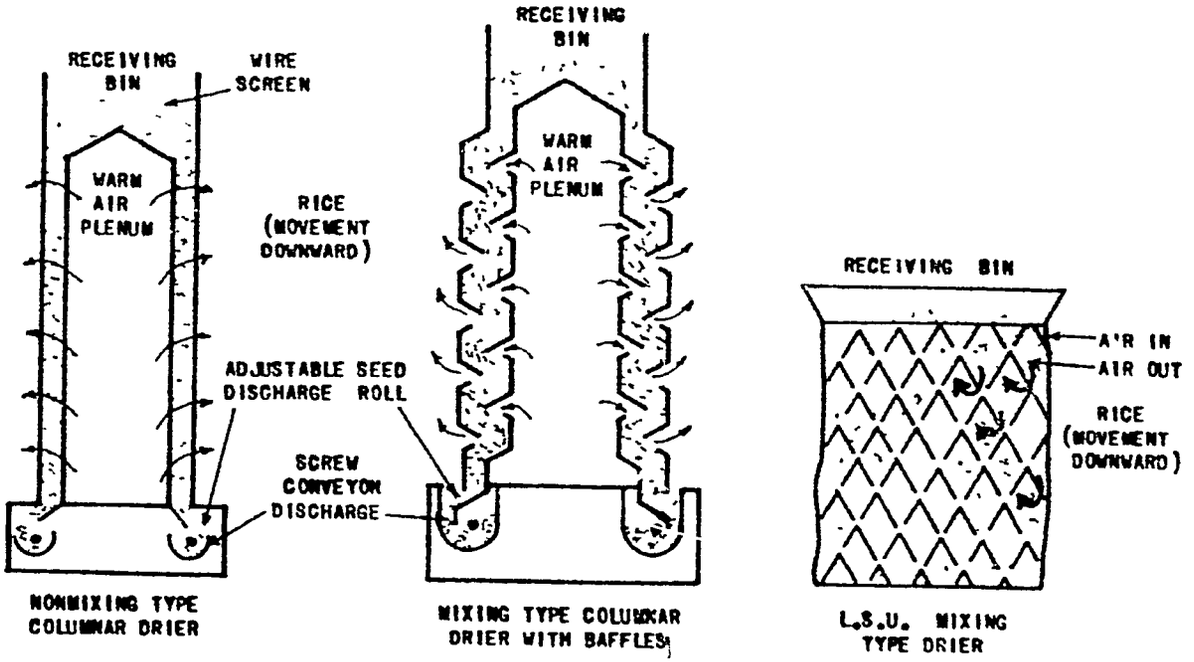

Figure 1 - Schematic Diagram of Flow Through Continuous-Flow Rice Dryers.

This diagram is intended only as an example of heated air applied to grain columns.
(After Traylor, Price and Markeson, 1967)

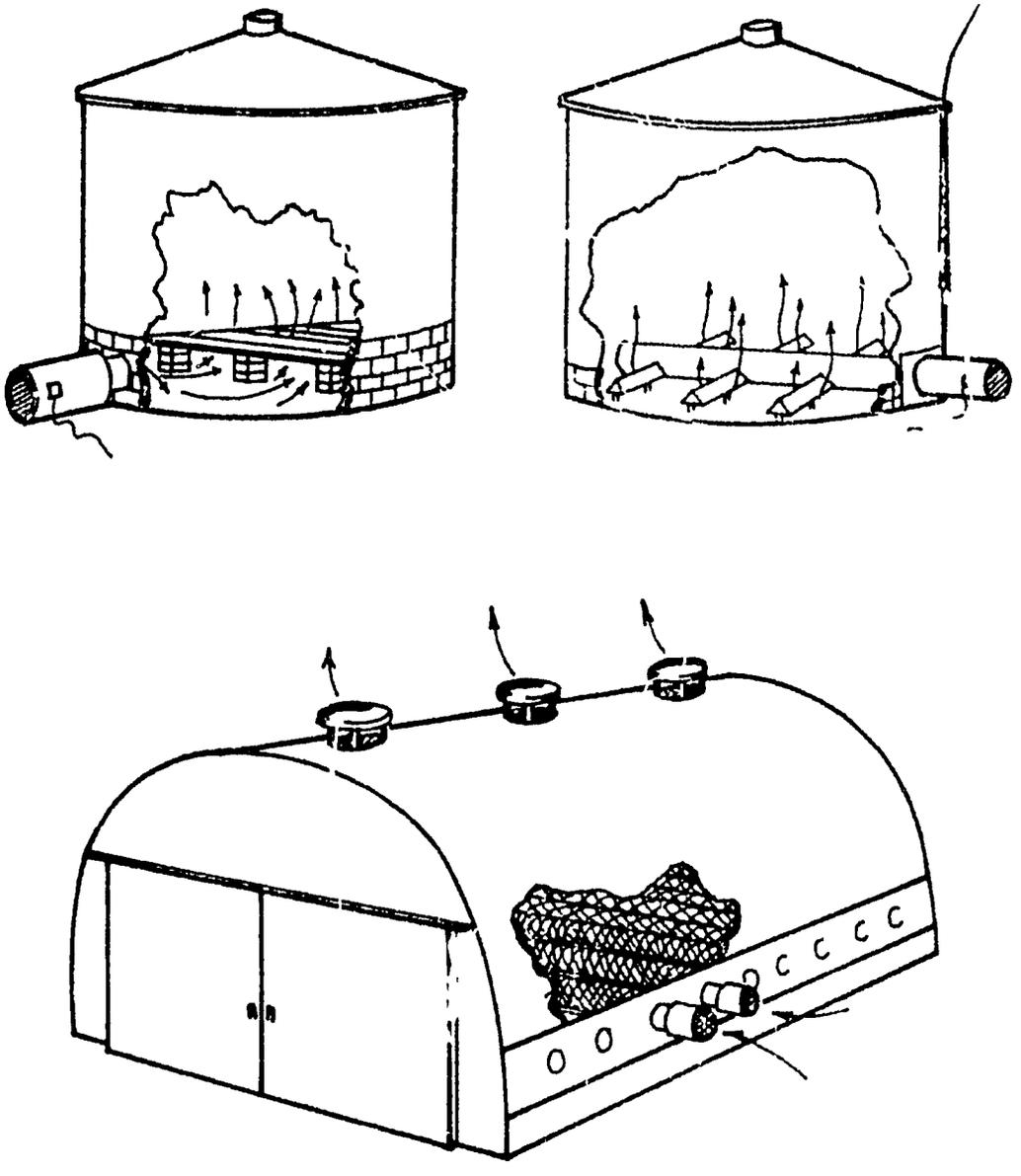

Figure 2 - Some Types of Bins and Air Distribution System Used for Grain Drying.
(After Traylor, Price and Markeson, 1967)

SOME U.S. COMPANIES WHICH MANUFACTURE GRAIN HANDLING, DRYING, AND/OR PROCESSING EQUIPMENT

BUILDINGS, GRAIN STORAGE (NOT BINS OR TANKS)

(1) ARMCO Steel Corporation
Metal Products Division
1001 Grove Street
Middletown, Ohio 45042

(2) Behlen Manufacturing Company
P.O. Box 569
Columbus, Nebraska 68601

(3) Big Chief of Nebraska Inc.
W. Highway 30
Grand Island, Nebraska 68801

(4) Butler Manufacturing Company
7400 E. 13th Street
Kansas City, Missouri 64126

(5) Central Texas Iron Works
2025 Webster Avenue
Waco, Texas 76703

(6) Columbian Steel Tank Company
1509 West 12th Street
Kansas City, Missouri 64101

(7) Cuckler Steel Span Company
P.O. Box 346
Monticello, Iowa 52310

(8) Economy Housing Company
6th and Chestnut
Wahdo, Nebraska 68066

(9) Lester's Inc.
Lester Prairie, Minnesota 55354

(10) Steel-Bilt Structures Inc.
1431 Regent Street
Madison, Wisconsin 53711

(11) Tyler Manufacturing Corporation
Benson, Minnesota 56215

(12) Walsh Manufacturing Company
1200 Fisher Street
Charles City, Iowa 50616

(13) Warp Brothers
1100 North Cicero Avenue
Chicago, Illinois 60651

CLEANERS AND GRADERS, SEED AND GRAIN

(1) Barnard & Leas Manufacturing Compnay, Inc.
1200-34 Twelfth Street S.W.
Cedar Rapids, Iowa 52906

(2) Burrows Equipment Company
1316 Sherman Avenue
Evanston, Illinois 60204

(3) Cleland Manufacturing Company
2800 Washington Avenue North
Minneapolis, Minnesota 55411

(4) The Hance Corporation
235 East Broadway
Westerville, Ohio 43081

(5) Hobbs Engineering Company
P.O. Box 1306
Suffolk, Virginia 23434

(6) Hutchinson Manufacturing Inc.
P.O. Box 33
Clay Center, Kansas 67432

(7) Seedburo Equipment Company
618 West Jackson Blvd.
Chicago, Illinois 60606

(8) The Snow Company
4350 McKinley Street
Omaha, Nebraska 68112

(9) Sprout, Waldron, & Company, Inc.
Muncy, Pennsylvania 17756

(10) Thoro-Speed Company
Agricultural Equipment Division
P.O. Box 27
Yellow Springs, Ohio 45387

(11) West Fargo Manufacturing Company
405 Main Street
West Fargo, North Dakota 58078

CROP DRYERS, AERATION (WITHOUT HEATING ELEMENT)

(1) Acme Engineering and Manufacturing Corporation
2000 North York Street
P.O. Box 1203
Muskogee, Oklahoma 74402

(2) Aerovent Fan & Equipment Inc.
5530 South Pennsylvania Avenue
P.O. Box 9007
Lansing, Michigan 48909

(3) Airfoil Impellers Corporation
P.O. Box A
College Station, Texas 77840

(4) Airmaster Division of Hayes Industry, Inc.
1623 Wildwood Avenue
Jackson, Michigan 49204

(5) American Farm Equipment Company
P.O. Box 277
Crystal Lake, Illinois 60014

(6) Baughman-Oster Inc.
Route 48 West
Taylorville, Illinois 62568

(7) Behlen Manufacturing Company
P.O. Box 569
Columbus, Nebraska 68601

(8) Big Chief of Nebraska Inc.
W. Highway 30
Grand Island, Nebraska 68801

(9) Butler Manufacturing Company
7400 East 13th Street
Kansas City, Missouri 64126

(10) Campbell Industries Inc.
3121 Dean Avenue
Des Moines, Iowa 50317

(11) Chicago Eastern Corporation
200 North Prospect Street
Marengo, Illinois 60152

(12) Clay Equipment Corporation
Cedar Falls, Iowa 50613

(13) Columbian Steel Tank Company
1509 West 12th. Street
Kansas City, Missouri 64101

(14) Curry Steel Products Company
P. O. Box 443
Independence, Missouri 64051

(15) Farm Fans Inc.
2222 North Olney
Indianapolis, Indiana 46218

(16) Fleischer Manufacturing Inc.
P. O. Box 848 Industrial Site
Columbus, Nebraska 68601

(17) Hartzell Propeller Fan Company
P. O. Box 909
Piqua, Ohio 45356

(18) Harvestall Industry Inc.
Three North Walnut
New Hampton, Iowa 50659

(19) Krenz & Company, Inc.
5114 West Center Street
Milwaukee, Wisconsin 53210

(20) Long Manufacturing Company, Inc.
Tarboro, North Carolina 27886

(21) Read Steel Products Inc.
P. O. Box 7343 A
Birmingham, Alabama 35223

(22) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(23) Revelle Builders
508 West Broad Street
Murfreesboro, North Carolina 27855

(24) George A. Rolfes Company
P. O. Box 548, Industrial Park
Boone, Iowa 50036

(25) Sioux Steel Company
196 1/2 East 6th Street
P. O. Box 898
Sioux Falls, South Dakota 57101

(26) Sunflower Manufacturing Company, Inc.
Asherville Road
P. O. Box 418
Beloit, Kansas 67420

(27) Swanson Machine Company
24 East Columbia Avenue
Champaign, Illinois 61820

(28) Wheat Belt Supply Company
P. O. Box 1015
Dodge City, Kansas 67801

(29) A. R. Wood Manufacturing Company
P. O. Box 218
Luuerne, Minnesota 56156

CROP DRYERS, BATCH - A Batch Non-Recirculating
B Batch Recirculating
C Batch Wagon Type

(1) Aeroglide Corporation - A, B
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) American Farm Equipment Company - A
P. O. Box 277
Crystal Lake, Illinois 60014

(3) Barrentine Manufacturing Co. - C
Greenwood, Mississippi 38930

(4) Behlen Manufacturing Co. - A
P. O. Box 569
Columbus, Nebraska 68601

(5) Butler Manufacturing Co. - A
7400 East 13th Street
Kansas City, Missouri 64126

(6) Campbell Industries Inc. - A, B, C
3121 Dean Avenue
Des Moines, Iowa 50317

(7) Chicago Eastern Corporation - A
200 North Prospect Street
Marengo, Illinois 60152

(8) Deere & Company
John Deere Road
Moline, Illinois 61265

(9) Gilmore & Tatge Manufacturing Co. Inc., - B
6th & Sherman
Clay Center, Kansas 67432

(10) Harrington Manufacturing Co., Inc., - C
P. O. Box 215
Lewiston, North Carolina 27849

(11) Papec Machine Company - C
Shortsville, New York 14548

(12) Pennington Manufacturing Co. - A
136 Commercial Road
Addison, Illinois 60101

(13) Reed Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(14) Sioux Steel Company - A
P. O. Box 898
196 1/2 East 6th. Street
Sioux Falls, South Dakota 57101

(15) Swanson Machine Company - C
24 East Columbia Avenue
Champaign, Illinois 61820

CHOP DRYERS, CONTINUOUS FLOW

(1) Aeroglide Corporation
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Arnold Dryer Company
Subs. of the Heil Company
3000 W. Montana Street
Milwaukee, Wisconsin 53201

(3) Behlen Manufacture
P. O. Box 569
Columbus, Nebraska 68601

(4) Campbell Industries Inc.
3121 Dean Avenue
Des Moines, Iowa 50317

(5) Chicago Eastern Corporation
200 North Prospect Street
Marengo, Illinois 60152

(6) Clay Equipment Corporation
Cedar Falls, Iowa 50613

(7) Grain Drying Equipment Company, Inc.
P. O. Box 168
Attica, Indiana 47918

(8) Hart-Carter Company
1209 West Pioneer Parkway
Peoria, Illinois 61614

(9) International Harvester Company
401 North Michigan Avenue
Chicago, Illinois 60611

(10) Mathews Company
500 Industrial Avenue
Crystal Lake, Illinois 60014

(11) Ransome Torch & Burner Company
1125 67th Street
Oakland, California 94608

CROP DRYERS, HEATED AIR (COMBINATION FAN & HEATER)

(1) Aerovent Fan & Equipment Inc.
5530 South Pennsylvania Avenue
P. O. Box 9007
Lansing, Michigan 48909

(2) Airfoil Impellers Corporation
P. O. Box A
College Station, Texas 77840

(3) Baughman-Oster Inc.
Route 48 West
Taylorville, Illinois 62052

(4) Behlen Manufacturing Company
P. O. Box 569
Columbus, Nebraska 68601

(5) Big Chief of Nebraska Inc.
W. Highway 30
Grand Island, Nebraska 68801

(6) Black, Sivalls, & Bryson, Inc.
Agricultural Equipment Division
7500 East 12th Street
Kansas City, Missouri 64126

(7) Butler Manufacturing Company
7400 East 13th Street
Kansas City, Missouri 64126

(8) Campbell Industries Inc.
3121 Dean Avenue
Des Moines, Iowa 50317

(9) Chicago Eastern Corporation
200 North Prospect Street
Marengo, Illinois 60152

(10) Columbian Steel Tank Company
1509 West 12th Street
Kansas City, Missouri 64101

(11) Consolidated Manufacturing Company
1360 West Oxford
P. O. Box 1100
Englewood, Colorado 80110

(12) Deere & Company
John Deere Road
Moline, Illinois 61265

(13) Farm Fans Inc.
2222 North Olney
Indianapolis, Indiana 46218

(14) Hart-Carter Company
1209 West Pioneer Parkway
Peoria, Illinois 61614

(15) Hartzell Propeller Fan Company
P.O. Box 909
Piqua, Ohio 45356

(16) Harvestall Industries Inc.
Three North Walnut
New Hampton, Iowa 50659

(17) Heberlein Manufacturing Company
P. O. Box 518
Ault, Colorado 80610

(18) Long Manufacturing Company, Inc.
Tarboro, North Carolina 27886

(19) Papec Machine Company
Shortsville, New York 14548

(20) Pennington Manufacturing Company
136 Commercial Road
Addison, Illinois 60101

(21) Read Steel Products Inc.
P. O. Box 7343 A
Birmingham, Alabama 35223

(22) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(23) Revelle Builders
508 West Broad Street
Murfreesboro, North Carolina 27855

(24) George A. Rolfes Company
P. O. Box 548 Industrial Park
Boone, Iowa 50036

(25) Siebring Manufacturing Company
George, Iowa 51237

(26) Sioux Steel Company
196 1/2 East 6th Street
P. O. Box 898
Sioux Falls, South Dakota 57101

(27) Swanson Machine Company
24 East Columbia Avenue
Champaign, Illinois 61820

(28) Todd Products, Division Todd Shipyards Corporation
120 Avenue
New York, New York 10017

CROP DRYERS, IN-STORAGE

(1) Aerovent Fan & Equipment Inc
5530 South Pennsylvania Avenue
P. O. Box 9007
Lansing, Michigan 48909

(2) Airfoil Impellers Corporation
P. O. Box A
College Station, Texas 77840

(3) Baughman-Oster Inc
Route 48 West
Taylorville, Illinois 62568

(4) Behlen Manufacture Company
P. O. Box 569
Columbus, Nebraska 68601

(5) Black, Sivalls, & Bryson Inc
Agricultural Equipment Division
7500 East 12th. Street
Kansas City, Missouri 64126

(6) Butler Manufacture Company
7400 East 13th. Street
Kansas City, Missouri 64126

(7) Campbell Industries Inc
3121 Dean Avenue
Des Moines, Iowa 50317

(8) Chicago Eastern Corporation
200 North Prospect Street
Marengo, Illinois 60152

(9) Clayton & Lambert Manufacture Company
Farm Products Division
Buckner, Kentucky 40010

(10) Columbian Steel Tank Company
1509 West 12th. Street
Kansas City, Missouri 64101

(11) Farm Fans Inc
2222 North Olney
Indianapolis, Indiana 46218

(12) Grove Manufacture Company
P. O. Box 21
Shady Grove, Pennsylvania 17256

(13) Hartzell Propeller Fan Company
P. O. Box 909
Piqua, Ohio 45356

(14) Harvestall Industries Inc
Three North Walnut
New Hampton, Iowa 50659

(15) Heal Company
1038 Irvins Place
Waukesha, Wisconsin 53186

(16) Long Manufacture Company
Tarboro, North Carolina 27886

(17) Pennington Manufacture Company
136 Commercial Road
Addison, Ill'nois 60101

(18) Read Steel Products Inc
P. O. Box 7343 A
Birmingham, Alabama 35223

(19) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(20) Revelle Builders
508 W. Broad Street
Murfreesboro, North Carolina 27855

(21) George A. Rolfes Company
P. O. Box 548, Industrial Park
Boone, Iowa 50036

(22) Sioux Steel Company
196 1/2 E. Sixth Street
P. O. Box 898
Sioux Falls, South Dakota 57101

(23) A. R. Wood Manufacture Company
P. O. Box 218
Luverne, Minnesota 56156

ELEVATORS, BELT TYPE, GRAIN & FEED

(1) Aeroglide Corporation
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Alvey Conveyor Manufacture Company
9301 Olive Blvd.
St. Louis, Missouri 63132

(3) Barber-Greene
400 North Highland Avenue
Aurora, Illinois 60507

(4) Baughman Manufacture Company, Inc
Shipman Road
Jerseyville, Illinois 62052

(5) The Belt Corporation
5314 Mill Street
Orient, Ohio 43146

(6) Bloom Inc
912 2nd. Street S. W.
Independence, Iowa 50644

(7) Bonded Scale & Machine Company
223 Bellevue
Columbus, Ohio 43207

(8) Bryant-Poff Inc
P. O. Box 127
Coatesville, Michigan 46121

(9) Clay Equipment Corporation
Cedar Falls, Iowa 50613

(10) Cleland Manufacture Company
2800 Washington Avenue North
Minneapolis, Minnesota 55411

(11) Deere & Company
John Deere Road
Moline, Illinois 61265

(12) The Duplex Mill & Manufacture Company
415 Sigler
P. O. Box 1266
Springfield, Ohio 45501

(13) The Eimco Corporation
P. O. Box 300
Salt Lake City, Utah 84110

(14) The Hance Corporation
235 East Broadway
Westerville, Ohio 43081

(15) Hayes & Stolz Industry Manufacturing Company, Inc.
P. O. Box 11217
Fort Worth, Texas 76109

(16) Hewitt-Robins, Inc.
Division of Litton Industries
666 Glenbrook Road
Stamford, Connecticut 0690

(17) Hobbs Engineering Company
P. O. Box 130
Suffolk, Virginia 23434

(18) The Jeffery Manufacturing Company
789 North 4th Street
Columbus, Ohio 4321

(19) Knoles Manufacturing Company
Glenbeulah, Wisconsin 53023

(20) Link Belt Company
Dept. AEYB-67
1700 Prudential Plaza
Chicago, Illinois 60601

(21) Long Manufacturing Company, Inc.
Tarboro, North Carolina 27886

(22) Sam Mulkey Company
P. O. Box 270
Lee's Summit, Missouri 64063

(23) Pittman Wood & Metal Products
Courtland, Virginia 23837

(24) The Red Cross Manufacture Corporation
124 South Oak
P. O. Box 111
Bluffton, Indiana 46714

(25) Revelle Builders
508 West Broad Street
Murfreesboro, North Carolina 27855

(26) Screw Conveyor Corporation
700 Hoffman Street
Hammond, Indiana 46230

(27) J. B. Sedberry Inc.
Social & Beverly Sts.
P. O. Box 986
Tyler, Texas 75701

(28) Seedburo Equipment Company
618 West Jackson Blvd.
Chicago, Illinois 60606

(29) Speed King Manufacture Company, Inc
P. O. Box 550
Dodge City, Kansas 67801

(30) Sprout, Waldron & Company, Inc
Muncy, Pennsylvania 17756

(31) Stone Conveyor Company, Inc
Stone Street
Honeoye, New York 14471

(32) Te-Co Inc
400 Russell Blvd.
St. Louis, Missouri 63104

(33) Thomas Conveyor Company, Inc
P. O. Box 249
Burleson, Texas 76028

(34) Thoro-Speed Company
Agricultural Equipment Division
P. O. Box 27
Yellow Springs, Ohio 45387

(35) Universal Inc
245 South Washington
Hudson, Iowa 50643

(36) Viking Manufacture Company
1635 Yuma
P. O. Box 68
Manhattan, Kansas 66502

(37) Wikomi Manufacture Company
South State Street Road
Litchfield, Illinois 62056

ELEVATORS, BUCKET, GRAIN & FEED

(1) Aeroglide Corporation
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Barber-Greene
400 N. Highland Avenue
Aurora, Illinois 60567

(3) Barnard & Leas Manufacture Company, Inc.
1200-34 Twelfth Street S. W.
Cedar Rapids, Iowa 52406

(4) Baughman Manufacture Company, Inc
Shipman Road
Jerseyville, Illinois 62052

(5) Bonded Scale & Machine Company
223 Bellevue
Columbus, Ohio 43207

(6) Bryant-Poff Inc
P. O. Box 127
Coatesville, Michigan 46121

(7) Burrows Equipment Company
1316 Sherman Avenue
Evanston, Illinois 60204

(8) Clay Equipment Corporation
Cedar Falls, Iowa 50613

(9) Cleland Manufacture Company
2800 Washington Avenue N.
Minneapolis, Minnesota 55411

(10) The Duplex Mill & Manufacture Company
415 Siegler
P. O. Box 1266
Springfield, Ohio 45501

(11) The Eimco Corporation
P. O. Box 300
Salt Lake City, Utah 84110

(12) Farm Fans Inc
2222 North Olney
Indianapolis, Indiana 46218

(13) Feed-O-Matic Systems Company
Kalona, Iowa 52247

(14) Gilmore & Tatge Manufacturing Company, Inc.
Sixth & Sherman
Clay Center, Kansas 67432

(15) The Hance Corporation
235 East Broadway
Westerville, Ohio 43081

(16) Hayes & Stolz Industry Manufacturing Company, Inc.
P. O. Box 11217
Fort Worth, Texas 76109

(17) Hewitt-Robins Inc.
Division of Litton Industries
666 Glenbrook Road
Stamford, Connecticut 06906

(18) Hutchinson Manufacture, Inc.
P. O. Box 33
Clay Center, Kansas 67432

(19) Industrial Machinery Company, Inc.
212 West Page Street
P. O. Box 1259
Fort Worth, Texas 76101

(20) The Jeffery Manufacturing Company
789 North Fourth Street
Columbus, Ohio 43216

(21) Link-Belt Company
Dept. AEYB-67
1700 Prudential Plaza
Chicago, Illinois 60601

(22) Long Manufacturing Company, Inc.
Tarboro, North Carolina 27886

(23) J. L. Mitchell
2268 N. Oxnard Blvd.
P. O. Box 1069
Oxnard, California 93033

(24) Myers-Sherman Company
Streator, Illinois 61364

(25) Pittman Wood & Metal Products
Courtland, Virginia 23837

(26) Prater Pulverizer Company
1515 South 55th Court
Chicago, Illinois 60650

(27) Redi-Mill Manufacture & Sales Corporation
P. O. Box 128
Brooker, Florida 32622

(28) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(29) Ross Machine & Mill Supply Inc
12 N. E. 28th. Street
Oklahoma City, Oklahoma 73105

(30) Screw Conveyor Corporation
700 Hoffman Street
Hammond, Indiana 46320

(31) J. B. Sedberry Inc
Social & Beverly Sts.
P. O. Box 986
Tyler, Texas 75701

(32) Seedburo Equipment Company
618 W. Jackson Blvd.
Chicago, Illinois 60606

(33) Sprout, Waldron, & Company, Inc
Muncy, Pennsylvania 17756

(34) Stone Conveyor Company, Inc
Stone Street
Honeoye, New York 14471

(35) Te-Co Company, Inc
400 Russell Blvd.
St. Louis, Missouri 63104

(36) Thomas Conveyor Company, Inc
P. O. Box 249
Burleson, Texas 76028

(37) Thoro-Speed Company
Agricultural Equipment Division
P. O. Box 27
Yellow Springs, Ohio 45387

(38) Universal Inc
245 S. Washington
Hudson, Iowa 50643

(39) West Fargo Manufacture Company
405 Main Street
West Fargo, North Dakota 58078

ELEVATORS, CHAIN-AND-FLIGHT, GRAIN & FEED - A Portable
B Stationary

(1) Aeroglide Corporation - B
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Auco New Idea Farm Equipment Division - A
Auco Corporation
Coldwater, Ohio 45828

(3) Badger Northland Inc. - B
215 West 2nd. Street
Kaukauna, Wisconsin 54130

(4) The Belt Corporation - A, B
5314 Mill Street
Orient, Ohio 43146

(5) Bloom Inc. - A, B
912 2nd. Street S. W.
Independence, Iowa 50644

(6) Burrows Equipment Company - A, B
1316 Sherman Avenue
Evanston, Illinois 60204

(7) J. I. Case Company - A
700 State Street
Racine, Wisconsin 53404

(8) Cardinal Division - A
LML Engineering & Manufacturing Corporation
607-617 S. Chauncey Street
Columbia City, Indiana 46725

(9) Clay Equipment Corporation - A
Cedar Falls, Iowa 50613

(10) Cleland Manufacturing Company - B
2800 Washington Avenue North
Minneapolis, Minnesota 55411

(11) Decker Manufacturing Company - A
122 South River Street
Janesville, Wisconsin 53545

(12) Deere & Company - A
John Deere Road
Moline, Illinois 61265

(13) The Duplex Mill & Manufacturing Company - A, B
415 Sigler
P. O. Box 1266
Springfield, Ohio 45501

(14) The Eimco Corporation - A, B
P. O. Box 300
Salt Lake City, Utah 84110

(15) Gruesbeck Manufacturing Company - A
P. O. Box 48
Ithaca, Michigan 48847

(16) Hayes & Stolz Industry Manufacturing Company, Inc. - B
P. O. Box 11217
Fort Worth, Texas 76109

(17) Henke Machine & Manufacturing Corporation
P. O. Box 642
Columbus, Nebraska 68601

(18) Hewitt-Robins Inc. - A, B
Division of Litton Industries
666 Glenbrook Road
Stamford, Connecticut 06906

(19) Industrial Machinery Company, Inc. - B
212 West Page
P. O. Box 1259
Fort Worth, Texas 76101

(20) The Jeffery Manufacturing Company
789 North 4th. Street
Columbus, Ohio 43216

(21) Kewanee Machinery & Conveyor Company - A, B
P. O. Box 358
Kewanee, Illinois 61443

(22) Knoedler Manufacturing Inc. - A, B
E. Broadway at Iowa Street
Streator, Illinois 61364

(23) Knowles Manufacturing Company - A
Glenbeulah, Wisconsin 53023

(24) Koyker Manufacturing Company - A
Division of Sioux Steel Company
Hull, Iowa 51239

(25) Link Belt Company - B
Dept. AEYB-67
1700 Prudential Plaza
Chicago, Illinois 60601

(26) Mayrath Company - A, B
10707 Lennox Lane
Dallas, Texas 75229

(27) Sam Mulkey Company - A, B
P. O. Box 270
Lee's Summit, Missouri 64063

(28) Myers-Sherman Company - B
Streator, Illinois 61364

(29) P & D Manufacture Company - A
Plainfield, Illinois 60544

(30) Palsgrove Manufacture Company
R. R. 1
Canal Winchester, Ohio 43110

(31) Pittman Wood & Metal Products - A, B
Courtland, Virginia 23837

(32) Portable Elevator Manufacture Company - A, B
920 East Grove Street
Bloomington, Illinois 61702

(33) The Red Cross Manufacture Corporation - A, B
124 South Oak
P. O. Box 111
Bluffton, Indiana 46714

(34) Seedburo Equipment Company - A, B
618 West Jackson Blvd.
Chicago, Illinois 60606

(35) Sprout, Waldron, & Company, Inc - B
Muncy, Pennsylvania 17756

(36) Standard Engineering Company, Inc - A
Fort Dodge, Iowa 50501

(37) Starline Inc.
300 West Front Street
Harvard, Illinois 60033

(38) Stone Conveyor Company, Inc. - A, B
Stone Street
Honeoye, New York 14471

(39) Te-Co Inc. - B
400 Russell Blvd.
St. Louis, Missouri 63104

(40) Thomas Conveyor Company, Inc - B
P. O. Box 249
Burleson, Texas 76028

(41) Thoro-Speed Company - B
Agricultural Equipment Division
P. O. Box 27
Yellow Springs, Ohio 45387

(42) Viking Manufacture Company - A, B
1635 Yuma Street
Manhattan, Kansas 66502

(43) Wetmore Inc - A, B
P. O. Box 307
Tonkawa, Oklahoma 74653

(44) George White & Sons - A
P. O. Box 129
London, Ontario
CANADA

(45) Wikomi Manufacture Company - A
South State Street Road
Litchfield, Illinois 62056

GRAIN BIN UNLOADERS, CYLINDRICAL, SWEEP

(1) Behlen Manufacture Company
P. O. Box 569
Columbus, Nebraska 68601

(2) Black, Sivalls, & Bryson Inc
Agricultural Equipment Division
7500 East 12th Street
Kansas City, Missouri 64126

(3) Butler Manufacture Company
7400 East 13th Street
Kansas City, Missouri 64126

(4) Cardinal Division
LML Engineering & Manufacture Corporation
607-617 S. Chauncey Street
Columbia City, Indiana 46725

(5) Columbian Steel Tank Company
1509 West 12th Street
Kansas City, Missouri 64101

(6) DK Manufacture Company
Materials Handling Division
100 North Island Avenue
Batavia, Illinois 60510

(7) The Duplex Mill & Equipment Company
415 Sigler
P. O. Box 1266
Springfield, Ohio 45501

(8) Farm Fans Inc
2222 North Olney
Indianapolis, Indiana 46218

(9) Gilmore & Tatge Manufacture Company, Inc
6th & Sherman
Clay Center, Kansas 67432

(10) Harvestall Industries Inc
Three North Walnut
New Hampton, Iowa 50659

(11) Hutchinson Manufacture Inc
P. O. Box 33
Clay Center, Kansas 67432

(12) Knoedler Manufactures Inc
E. Broadway at Iowa Avenue
Streator, Illinois 61364

(13) Long Manufacture Company, Inc
Tarboro, North Carolina 27886

(14) Martin Steel Corporation
111 Longview Avenue
Mansfield, Ohio 44901

(15) Read Steel Products Inc
P. O. Box 7343 A
Birmingham, Alabama 35223

(16) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(17) Sioux Steel Company
P. O. Box 898
196 1/2 East 6th Street
Sioux Falls, South Dakota 57101

(18) Sudenga Industries Inc
P. O. Box 398
George, Iowa 51237

(19) Viking Manufacture Company
1635 Yuma
P. O. Box 68
Manhattan, Kansas 66502

(20) The Wyatt Manufacture Company, Inc
P. O. Box 1277
Salina, Kansas 67401

GRAIN BINS & TANKS, STORAGE - A Cylindrical
B Non-Cylindrical
C High Moister

(1) Aeroglide Corporation - A, B
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Baughman-Oster Inc - A
Route 48 West
Taylorville, Illinois 62568

(3) Behlen Manufacture Company - A, C
P. O. Box 569
Columbus, Nebraska 68601

(4) Bethlehem Steel Corporation - A
Buffalo Tank Division
South Avenue
Dunellen, New Jersey 08812

(5) Big Chief of Nebraska Inc - A
West Highway 30
Grand Island, Nebraska 68801

(6) Black, Sivalls, & Bryson, Inc - A
Agricultural Equipment Division
7500 East 12th Street
Kansas City, Missouri 64126

(7) Bonded Scale & Machine Company
223 Bellevue
Columbus, Ohio 43207

(8) Burrows Equipment Company - A, B
1316 Sherman Avenue
Evanston, Illinois 60204

(9) Butler Manufacture Company - A, B, C
7400 East 13th Street
Kansas City, Missouri 64126

(10) Clayton & Lambert Manufacture Company, - A, C
Farm Products Division
Buckner, Kentucky 40010

(11) Columbian Steel Tank Company - A, B
1509 West 12th Street
Kansas City, Missouri 64101

(12) Curry Steel Products Company - A
P. O. Box 443
Independence, Missouri 64051

(13) Doeer Metal Products - A
320 East 6th. Street
Larned, Kansas 67550

(14) The Duplex Mill & Manufacture Company - A, B
415 Sigler
P. O. Box 1266
Springfield, Ohio 45501

(15) Eaton Metal Products Corporation - A
1301 Willis Avenue
Omaha, Nebraska 68110

(16) Farm Fans Inc. - B
2222 North Olney
Indianapolis, Indiana 46218

(17) Fibertron Corporation - C
1033 Cardinal Road
Cedarburg, Wisconsin 53012

(18) Graver Tank & Manufacture Company - A
Division Union Tank Car Company
4809 Tod Avenue
East Chicago, Indiana 46312

(19) Grove Manufacture Company - A
P. O. Box 21
Shady Grove, Pennsylvania 17256

(20) The Hance Corporation - B
235 East Broadway
Westerville, Ohio 43081

(21) Harvestall Industries Inc - A
Three North Walnut
New Hampton, Iowa 50659

(22) Henke Machine & Manufacture Corporation - B
P. O. Box 642
Columbus, Nebraska 68601

(23) Long Manufacture Company, Inc
Tarboro, North Carolina 27886

(24) Madison Silos
Division of Martin Marietta Corporation
P. O. Box 271
Madison, Wisconsin 53701

(25) Martin Steel Corporation - A, C
111 Longview Avenue
Mansfield, Ohio 44901

(26) Myers-Sherman Company - B
Streator, Illinois 61364

(27) Pennington Manufacture Company - A
136 Commercial Road
Addison, Illinois 60101

(28) Read Steel Products Inc - A
P. O. Box 7343 A
Birmingham, Alabama 35223

(29) Reed-Joseph Company - A, B, C
P. O. Box 479
Greenville, Mississippi 38701

(30) Ross Equipment Company - A
Division of William Bayley Company
1200 Warder Street
Springfield, Ohio 45501

(31) Sioux Steel Company - A
196 1/2 East 6th Street
P. O. Box 898
Sioux Falls, South Dakota 57101

(32) Stone Conveyor Company, Inc - A, B, C
Stone Street
Honeoye, New York 14471

(33) A. O. Smith Harvestore Products, Inc - A, C
550 West Algonquin Road
Arlington Heights, Illinois 60005

(34) Sprout, Waldron, & Company, Inc - A, B
Muncy, Pennsylvania 17756

(35) Westeel-Rosco Ltd. - A
P. O. Box 792
Winnipeg 1, Manitoba, Canada

GRAIN DISTRIBUTORS AND LEVELERS, IN-STORAGE

(1) Aeroglide Corporation
6300 Hillsboro Road
Raleigh, North Carolina 27602

(2) Baughman-Oster Inc.
Route 48 West
Taylorville, Illinois 62052

(3) Behlen Manufacturing Co.
P. O. Box 569
Columbus, Nebraska 68601

(4) Big Chief of Nebraska Inc.
West Highway 30
Grand Island, Nebraska 68801

(5) Black, Sivalls, & Bryson Inc.
Agricultural Equipment Division
7500 East 12th Street
Kansas City, Missouri 64126

(6) Brower Manufacturing Co.
640 South 5th Street
Quincy, Illinois 62301

(7) Burrows Equipment Co.
1316 Sherman Avenue
Evanston, Illinois 60204

(8) Butler Manufacturing Co.
7400 East 13th Street
Kansas City, Missouri 64126

(9) Clayton & Lambert Manufacturing Co.
Farm Products Division
Buckner, Kentucky 40010

(10) Columbian Steel Tank Co.
1509 West 12th Street
Kansas City, Missouri 64101

(11) The Duplex Mill & Manufacturing Co.
415 Sigler
P. O. Box 1266
Springfield, Ohio 45501

(12) Farm Fans Inc.
2222 North Olney
Indianapolis, Indiana 46218

(13) Grove Manufacture Company
P. O. Box 21
Shady Grove, Pennsylvania 17256

(14) The Hance Corporation
235 East Broadway
Westerville, Ohio 43081

(15) Harvestall Industries Inc
Three North Walnut
New Hampton, Iowa 50659

(16) Hayes & Stoltz Industry Manufacture Company, Inc
P. O. Box 11217
Fort Worth, Texas 76109

(17) Martin Steel Corporation
111 Longview Avenue
Mansfield, Ohio 44901

(18) Prater Pulverizer Company
1515 South 55th Court
Chicago, Illinois 60650

(19) Redi-Mill Manufacture & Sales Corporation
P. O. Box 128
Brooker, Florida 32622

(20) Reed-Joseph Company
P. O. Box 479
Greenville, Mississippi 38701

(21) Screw Conveyor Corporation
700 Hoffman Street
Hammond, Indianam 46320

(22) Seedburo Equipment Company
618 West Jackson Blvd.
Chicago, Illinois 60606

(23) Sioux Steel Company
196 1/2 East 6th Street
P. O. Box 898
Sioux Falls, South Dakota 57101

(24) Stone Conveyor Company, Inc
Stone Street
Honeoye, New York 14471

(25) Sunflower Manufacture Company, Inc
Asherville, Road
P. O. Box 418
Beloit, Kansas 67420

(26) Walsh Manufacture Company
1200 Fisher Street
Charles City, Iowa 50616