



## Cooperative Extension Service

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**REVISED SEPTEMBER 19, 1990**

### **1989 GRAIN DUST EXPLOSIONS STAY LOW\***

Thirteen grain dust explosions were reported in the U.S. in 1989 according to data compiled by Ralph Regan, FGIS Safety Director, and Robert W. Schoeff, Extension Marketing and Safety Specialist, Kansas State University. This compares to 12 in 1988 and a ten-year average of 20 explosions.

There were only two fatalities compared to eight in 1988, none in 1987 and 1983. Seven injured was a new record low.

Most of the explosions continue to occur in grain elevators, seven of 12, with two in corn processing, and one each in feed mill and starch processing plants.

The principal location of the primary explosion was the elevator leg, five, and dust systems, three of 13.

The probable cause of the primary explosion was fire in five of the 13 explosions. Welding/cutting, foreign material, friction and metal sparks were identified as other probable causes.

Corn dust was involved in five of 13 cases; oat hulls, beet pulp, corn gluten feed, corn starch, wheat starch, sorghum and soybeans were other fuel sources.

Explosions occurred in seven states: three in Kansas and Iowa, two in Illinois and Louisiana and one each in Nebraska, Minnesota, and Washington.

Appreciation is expressed to the many people who were willing to provide this information which is based on voluntary reports and published information.

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KSU, County Extension  
Councils and U.S. Department  
of Agriculture Cooperating.

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\*This report subject to revision as additional information is received.

**REPORTED GRAIN DUST EXPLOSIONS IN U.S. - 1989\*\*  
REVISED SEPTEMBER 19, 1990**

<u>NO.</u>	<u>DATE</u>	<u>COMPANY AND ADDRESS</u>	<u>FACILITY</u>	<u>DAMAGE*</u>	<u>KILLED</u>	<u>INJURED</u>
1	Feb. 3	Midwest Grain Products Inc. Atchison, KS	Bulk Feed Warehouse	Moderate	0	0
2	Feb. 14	Quaker Oats Co. Cedar Rapids, IA	Chemical Processing Plant	Minor	0	0
3	Mar. 30	Zen-Noh Grain Corp. Convent, LA	Port Elevator	Moderate	0	0
4	Apr. 1	Elenbaas Co. Inc. Sumas, WA	Feed Plant	Minor	0	0
5	May 12	A.E. Staley Mfg. Co. Decatur, IL	Wet Corn Mill	Severe	0	0
6	July 27	Montezuma Co-op Montezuma, KS	Grain Elevator	Severe	0	2
7	Aug. 16	Ferruzzi, USA, Inc. Elev. Belle Chasse, IA	Port Elevator	Moderate	0	0
8	Sept. 22	Cargill Inc. Bingham Lake, MN	Country Elevator	Moderate	2	3
9	Nov. 10	Sandahl Farm Supply Cherry Valley, IL	Country Elevator	Moderate	0	0
10	Nov. 13	The Hubinger Co. Keokuk, IA	Wet Corn Mill	Minor	0	0
11	Nov. 22	Ogilvie Inc. Keokuk, IA	Starch Plant	Moderate	0	0
12	Dec. 5	Quad County Cooperative Exeter, NE	Grain Elevator	Moderate	0	2
13	Dec. 10	Shawnee Terminal Elevator Topeka, KS	Grain Elevator	Moderate	0	0
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TOTAL NUMBER OF INCIDENTS					13	
						2
						7

\*Minor - Less than \$50,000  
 Moderate - 50,000 - \$500,000  
 Severe - Over \$500,000

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 January 8, 1990  
 in cooperation with  
 Ralph Regan, FGIS,  
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\*\* This report is subject to revision as new information is received.

U.S. DUST EXPLOSION STATISTICS\*

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
Number	44	21	14	13	21	22	21	15	12	13
Dead	10	13	6	0	9	4	2	0	8	2
Injured	47	62	34	14	30	20	14	18	10	7
Est. Damage to Fac. (\$ Mil.)	10.0	29.0	15.0	3.6	19.9	65.0	1.6	8.3	8.7	3.9
Type of Facility:										
Grain Elevator	27	19	11	9	13	18	11	11	7	7
Feed Mill	8	1	2	4	5	1	5	4	1	1
Flour Mill	1	0	0	0	1	0	1	0	0	0
Other:										
Corn Milling, Dry	2	0	0	0	1	2	0	0	2	1
Corn Milling, Wet	0	0	1	0	0	0	0	0	0	2
Brewery	2	0	0	0	0	0	0	0	0	0
Soybean	1	0	0	0	1	0	0	0	0	0
Alfalfa Dehy.	1	0	0	0	0	0	0	0	0	0
Rice Mill	0	1	0	0	0	1	2	0	1	0
Oat Mill	0	0	0	0	0	0	0	0	1	0
Unidentified	0	0	0	0	1	0	2	0	0	0
Total - Other	6	1	1	0	3	3	4	0	4	2

\*Source: Robert W. Schoeff, Dept. of Grain Science & Industry, Kansas State University, in cooperation with Ralph Regan, FGIS-USDA, REVISED SEPTEMBER 19, 1990

U.S.

GRAIN DUST EXPLOSIONS

LEADING STATES - 1958 To DATE

	<u>1958-82</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1958-89 TOTAL</u>
NEBRASKA	45	1	6	4	2	0	0	1	59
ILLINOIS	37	2	2	4	1	2	1	2	51
IOWA	41	0	0	2	2	2	1	3	51
TEXAS	30	3	1	1	2	1	1	0	39
MINNESOTA	26	2	1	2	1	1	3	1	37
KANSAS	21	0	0	1	5	0	0	3	30
MISSOURI	23	0	0	0	1	2	0	0	26
OHIO	15	0	0	2	0	2	0	0	19
OKLAHOMA	15	0	0	0	0	0	1	0	16
NEW YORK	9	0	0	0	0	0	0	0	9
WISCONSIN	9	0	0	0	0	0	0	0	9

Source: Robert W. Schoeff  
Kansas State University  
Manhattan, KS  
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**DUST EXPLOSIONS BY COMMODITY HANDLED AT TIME OF EXPLOSION**

**1983 TO DATE**

<u>COMMODITY</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>
<b>CORN</b>	<b>8</b>	<b>12</b>	<b>14</b>	<b>7</b>	<b>12</b>	<b>8</b>	<b>5</b>
<b>SORGHUM</b>	<b>2</b>	<b>-</b>	<b>2</b>	<b>5</b>	<b>-</b>	<b>-</b>	<b>2</b>
<b>SOYBEANS</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
<b>WHEAT</b>	<b>-</b>	<b>4</b>	<b>-</b>	<b>2</b>	<b>-</b>	<b>1</b>	<b>-</b>
<b>BARLEY</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>OATS</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>
<b>BARLEY CHAFF- MALT SPROUTS</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>BEET PULP</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>
<b>BREWERS GRAINS</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>CORN STARCH</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>
<b>CORN GLUTEN MEAL</b>	<b>-</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>1</b>
<b>GRAIN SCREENINGS</b>	<b>1</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>
<b>RICE (BRAN)</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>WHEAT STARCH</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>
<b>MIXED FEED</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1</b>	<b>-</b>	<b>-</b>
<b>NONE</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>-</b>
<b>TOTAL EXPLOSIONS</b>	<b>13</b>	<b>20</b>	<b>22</b>	<b>21</b>	<b>15</b>	<b>12</b>	<b>13</b>

Source: Robert W. Schoeff, Kansas State University, **REVISED SEPTEMBER 19, 1990**