



Cooperative Extension Service

Extension Grain Science and Industry
Shellenberger Hall
Manhattan, Kansas 66506-2201
913-532-6161
FAX 913-532-7010

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GRAIN DUST EXPLOSIONS DOWN IN 1991*

Only twelve grain dust explosions were recorded in the U.S. in 1991 according to data compiled by Ralph Regan, FGIS Safety Director, and Robert W. Schoeff, Marketing and Safety Specialist, Kansas State University. This compares to 15 in 1990 and a ten-year average of 16 explosions.

There was one fatality compared to none in 1990 and two in 1989. Four injured is a record low number.

For the first time in many years, grain elevators were not the predominate location of the grain dust explosions, four out of 12, with four occurring in feed mills and one each in flour and rice mills and starch and cereal plants.

The elevator leg continued as the principal location of the primary explosions with five, compared to four in bag dust collectors.

The probable cause was fire originating in a hammermill in three cases, three were unknown, and two were from friction sparks.

Fuel sources were identified as corn (5), followed by wheat, wheat gluten, wheat screenings, wheat midds, rice flour, barley, and oats.

Grain dust explosions occurred in nine states across the country: four in Iowa, and one (each in Arkansas, Georgia, Indiana, Kansas, Nebraska, Ohio, Virginia, and Washington).

Estimated property damage was a record low of \$289,000 for the 12 grain dust explosions.

There was one agricultural related dust explosion at the American Crystal Sugar Co. plant in Hillsboro, North Dakota on February 2, 1992 that injured two and damaged the sugar load-out facilities.

Each year appreciation is expressed to the many persons who willingly provide the information that allows us to build a data base on grain dust explosions that does not exist in any other industry in the U.S.

Robert W. Schoeff
Dept. of Grain Science & Industry
Kansas State University
Manhattan, KS 66506-2201
January 8, 1992

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

REPORTED GRAIN DUST EXPLOSIONS IN U.S. - 1991**

<u>NO.</u>	<u>DATE</u>	<u>COMPANY AND ADDRESS</u>	<u>FACILITY</u>	<u>DAMAGE*</u>	<u>KILLED</u>	<u>INJURED</u>
1	Apr. 1	Ogilvie Mills Keokuk, IA	Starch Plant	Moderate	0	0
2	Apr.10	Cereal Food Processors Wichita, KS	Flour Mill	Moderate	0	0
3	Apr. 10	Farmers Co-op Nashua, IA	Grain Elevator	Minor	0	1
4	Apr. 30	Riceland Foods Jonesboro, AR	Rice Mill	Minor	0	0
5	May 23	Greenwood Farmers Co-op Greenwood, NE	Grain Elevator	Minor	0	2
6	May 31	Continental Grain Co. Arcanum, OH	Grain Elevator	Minor	0	0
7	July 23	Darigold Feed Co. Chehalis, WA	Feed Mill	Moderate	1	0
8	Aug. 21	Crystal Farms Gainesville, GA	Feed Mill	Minor	0	0
9	Sept. 23	Rocco Feed Mill Harrisonburg, VA	Feed Mill	Minor	0	0
10	Sept. 24	National Oats Co. Cedar Rapids, IA	Cereal Plant	Minor	0	0
11	Sept. 27	Leffert Grain Co. Walton, IN	Grain Elevator	Minor	0	1
12	Oct.10	Monona Coop Co. Monona, IA	Feed Mill	Minor	0	0
TOTALS					1	4

*Minor - Less than \$50,000
 Moderate - 50,000 - \$500,00
 Severe - Over \$500,000

Robert W. Schoeff
 Kansas State University
 Manhattan, KS 66506
 January 8, 1992
 in cooperation with
 Ralph Regan, FGIS,
 USDA, Washington, DC

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U.S. DUST EXPLOSION STATISTICS*

	<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>	<u>1990</u>	<u>1991</u>
Number	21	14	13	21	22	21	15	12	13	15	12
Dead	13	6	0	9	4	2	0	8	2	0	1
Injured	62	34	14	30	20	14	18	10	7	7	4
Est. Damage to Fac. (\$ Mil.)	29.0	15.0	3.6	19.9	65.0	1.6	8.3	8.7	3.9	5.0	.3
Type of Facility:											
Grain Elevator	19	11	9	13	18	11	11	7	7	8	4
Feed Mill	1	2	4	4	1	5	4	1	1	1	4
Flour Mill	0	0	0	1	0	1	0	0	0	2	1
Other:											
Corn Milling, Dry	0	0	0	1	2	0	0	2	1	1	0
Corn Milling, Wet	0	1	0	0	0	0	0	0	2	1	0
Brewery	0	0	0	0	0	0	0	0	0	0	0
Soybean	0	0	0	1	0	0	0	0	0	0	0
Alfalfa Dehy.	0	0	0	0	0	0	0	0	0	0	0
Rice Mill	1	0	0	0	1	2	0	1	0	1	1
Oat Mill	0	0	0	0	0	0	0	1	0	0	0
Unidentified	0	0	0	0	0	2	0	0	0	0	0
Other	0	0	0	1	0	0	0	0	2	1	2

*Source: Robert W. Schoeff, Dept. of Grain Science & Industry, Kansas State University, in cooperation with Ralph Regan, FGIS-USDA, January 8, 1992

U.S.
GRAIN DUST EXPLOSIONS
LEADING STATES - 1958 to Date

	<u>1958-83</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>	<u>1991</u>	<u>1958-91 TOTAL</u>
Nebraska	46	6	4	2	0	0	1	0	1	60
Iowa	41	0	2	2	2	1	3	0	4	55
Illinois	39	2	4	1	2	1	2	2	0	53
Texas	33	1	1	2	1	1	0	1	0	40
Minnesota	28	1	2	1	1	3	1	2	0	39
Kansas	21	0	1	5	0	0	3	3	1	34
Missouri	23	0	0	1	2	0	0	1	0	27
Ohio	15	0	2	0	2	0	0	1	1	21
Oklahoma	15	0	0	0	0	1	0	0	0	16
New York	9	0	0	0	0	0	0	0	0	9
Wisconsin	9	0	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>	<u>1990</u>	<u>1991</u>
Corn	8	12	14	7	12	8	5	4	5
Sorghum	2	-	2	5	-	-	2	1	0
Soybeans	1	2	-	1	1	1	1	1	0
Wheat	-	4	-	2	-	1	-	1	1
Barley	-	-	1	1	-	-	-	1	1
Oats	-	-	-	-	-	1	1	-	1
Barley Chaff-Malt Sprouts	-	-	-	1	-	-	-	-	0
Beet Pulp	-	-	-	-	-	-	1	-	0
Corn Starch	-	-	1	-	-	-	1	-	0
Corn Gluten Meal	-	1	2	-	-	1	1	-	0
Distillers Feed	-	-	-	-	-	-	-	1	0
Feed By-Products	-	-	-	-	-	-	-	1	0
Grain Screenings	1	-	-	-	1	-	-	-	0
Mixed Feed	-	-	-	-	1	-	-	-	0
Rice (Bran) (Flour)	-	-	1	2	-	-	-	1	1
Wheat Flour	-	-	-	-	-	-	-	1	0
Wheat (Mids) (Screenings)	-	-	-	-	-	-	-	-	2
Wheat (Starch) (Gluten)	-	-	-	-	-	-	1	-	1
None	1	1	1	2	-	-	-	-	0
TOTAL EXPLOSIONS	13	20	22	21	15	12	13	15	12

Source: Robert W. Schoeff, Kansas State University, January 8, 1992