

February 4, 2000

Agricultural Dust Explosions in 1999*

There were seven dust explosions reported in the U.S. in 1999 according to Robert W. Schoeff, Professor Emeritus, Kansas State University, and Mavis Rogers, FGIS-USDA. This compares to 18 in 1998, a ten year average of 12.9 explosions, and is the lowest in seven years.

There were no fatalities and 19 injured. Two major incidents of 10 and 7 injured accounted for most of the total.

The **primary explosion** occurred in the bucket elevator in four cases and in a grain storage silo, grinding area, and work floor.

The **probable ignition source** was unknown in 4 of the 7 incidents while electrical problems, metal sparks, and tire were identified.

Fuel sources were identified as corn in all seven cases.

Dust explosions occurred in six different states: Kansas, Illinois, Iowa, Wisconsin, South Carolina, and two in Minnesota.

This report is based on a variety of news sources and the voluntary cooperation of management as we seek to identify that agricultural dust explosions have occurred and what the causes might have been. The data is compiled as a service to the grain storage and processing and allied industries, trade associations, insurance companies, and government agencies.

Please give credit when using these data in your publications and electronic media.

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

REPORTED DUST EXPLOSIONS IN U.S.-1999**

<u>NO</u>	<u>DATE</u>	<u>COMPANY</u>	<u>ADDRESS</u>	<u>FACILITY</u>	<u>DAMAGE*</u>	<u>KILLED</u>	<u>INJURED</u>
1	Feb 1	Jacobson Grain Terminal	Dwight, IL	Grain Elevator	Moderate	0	1
2	Feb 3	Butterball Turkey Company	Sherwin, KS	Feed Mill ¹	Moderate	0	0
3	Apr 19	Farmers Coop Company	Craig, IA	Feed Mill	Moderate	0	1
4	Aug 2	Amick Farms	Monetta, SC	Feed Mill ¹	Moderate	0	10
5	Aug 16	Bunge	Savage, NM	Grain Elevator	Severe	0	0
6	Sept 3	Cenex-Harvest States Coop	Tracy, MN	Grain Elevator	Moderate	0	0
7	Oct 26	Reedsville Coop	Reedsville, WI	Feed Mill	Severe	0	7
TOTALS:						0	19

¹ Explosion occurred in grain storage facility

*Minor: Less than \$50,000; Moderate: \$50,000-\$500,000; Severe: over \$500,000.

**Report is subject to revision as new information is received.

In cooperation with FGIS-USDA, Washington, DC.

Robert W. Schoeff
 Kansas State University
 Manhattan, KS 66506-2201
 February 4, 2000

TABLE 1. U.S. GRAIN DUST EXPLOSION STATISTICS*

	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>TEN YEAR TOTAL</u>
Number	15	12	6	13	15	14	13	16	18	7	129
Dead	0	1	1	2	1	1	1	1	7	0	15
Injured	7	4	8	20	14	12	19	14	24	19	141
Est. Damage to Facility (\$ Mil.)	5.0	.3	.4	4.0	7.1	6.7	29.6	11.4	29.8	4.4	98.7
Type of Facility:											
Grain Elevator	8	4	5	9	7	4	4	9	11	3	64
Feed Mill	1	4	0	0	3	4	4	2	3	4*	25
Flour Mill	2	1	0	1	2	0	1	1	0	0	8
Other:											
Corn Milling, Dry	1	0	0	0	0	1	1	0	0	0	3
Corn Milling, Wet	1	0	0	1	1	2	0	0	1	0	6
Rice Mill	1	1	0	0	0	2	1	0	0	0	5
Oat Mill	0	0	0	0	0	0	0	0	0	0	0
Other	1	2	1	2	2	1	2	4	3	0	18

*In 2 cases the explosion occurred in raw grain storage facilities.

Source: Robert W. Schoeff, Kansas State University, in cooperation with FGIS-USDA, February 4, 2000

TABLE 2. GRAIN DUST EXPLOSIONS
BY COMMODITY HANDLED AT TIME OF EXPLOSION
1990-1999

<u>COMMODITY</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>TEN YEAR TOTAL</u>
Corn	4	5	4	9	8	3	5	8	9	7	62
Sorghum	1	0	0	0	1	0	0	0	0	0	2
Soybeans	1	0	0	1	0	1	2	2	1	0	8
Wheat	1	1	1	1	2	1	0	3	2	0	12
Barley (malted)	1	1	0	0	1	0	1	0	0	0	4
Oats	0	1	0	0	1	0	0	0	0	0	2
Beet Pulp	0	0	0	0	0	0	1	0	0	0	1
Corn Starch	0	0	1	2	0	2	0	0	1	0	6
Corn Gluten Meal	0	0	0	0	0	0	0	0	0	0	0
Distillers Feed	1	0	0	0	0	1	0	0	0	0	2
Feed By-Products	1	0	0	0	0	0	0	0	0	0	1
Grain Screenings	0	0	0	0	0	0	0	0	0	0	0
Mixed Feed	0	0	0	0	0	2	1	0	0	0	3
Rice (Bran)(Flour)(Hulls)	1	0	0	0	1	3	1	0	0	0	6
Wheat Flour	1	0	0	0	0	0	1	1	1	0	4
Wheat (Starch) (Gluten)	0	0	0	0	0	0	0	0	1	0	1
Other	3	4	0	0	1	2	1	2	3	0	16
TOTAL EXPLOSIONS	15	12	6	13	15	15	13	16	18	7	130

Source: Robert W.Schoeff, Kansas State University, in cooperation with FGIS-USDA, February 4, 2000

TABLE 3. U.S. GRAIN DUST EXPLOSIONS

LEADING STATES - 1958 to Date

<u>STATE</u>	<u>1958-1989</u>	<u>1990</u>	<u>1991</u>	<u>1992</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>10-YEAR TOTAL</u>
Iowa	51	0	4	2	1	4	2	3	3	1	1	21
Kansas	31	3	1	0	0	3	0	0	0	6	1	14
Nebraska	59	0	1	0	3	1	1	1	5	1	0	13
Illinois	51	2	0	1	0	1	3	1	1	1	1	11
Minnesota	37	2	0	0	1	1	0	2	1	1	2	10
Ohio	21	1	1	0	2	0	1	0	1	1	0	7
Louisiana	13	2	0	0	2	0	0	0	0	0	0	4
Indiana	19	0	1	0	1	1	0	0	0	1	0	4
Texas	39	1	0	1	0	0	1	0	0	1	0	4
South Dakota	7	0	0	1	0	0	0	1	1	1	0	4
Washington	4	1	1	0	0	0	1	0	0	0	0	3
Missouri	26	1	0	0	0	0	0	0	0	1	0	2

Source: Robert W. Schoeff, Kansas State University, in cooperation with FGIS-USDA, February 4, 2000