**Agricultural Dust Explosions in 2021**\*

There were 6 grain dust explosions reported in the U.S. in 2021 according to Kingsly Ambrose, Associate Professor, Purdue University. This compares to 8 in 2020 and a ten-year average of 7.9 explosions.

There were 1 fatality and 5 injuries.

The explosions were in 1 feed mill, 1 ethanol plant, 1 grain mill and 3 grain elevators.

The **probable ignition sources** were identified in 1 case as fire, 1 as grain smoldering and 4 unknowns.

**Fuel sources** were identified as 4 from grain dust and 2 unknowns.

**Dust explosions** occurred in 5 different states: 2 in Minnesota, and 1 each in Georgia, Idaho, Indiana, Oregon.

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

REPORTED DUST EXPLOSIONS IN U.S. 2021

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| No | DATE | COMPANY | ADDRESS | FACILITY | FATALITIES | INJURED |
| 1 | 3/23/2021 | Riches Seeds | Silverton, OR | Grain elevator | 1 | 1 |
| 2 | 5/17/2021 | Double J Milling | Mountain Home, ID | Grain elevator | 0 | 1 |
| 3 | 6/1/2021 | Christensen Farms | Sleepy Eye, MN | Feed mill | 0 | 0 |
| 4 | 6/1/2021 | Farmer’s Co-op of Hanska | New Ulm, MN | Grain elevator | 0 | 1 |
| 5 | 7/28/2021 | Grain Plains | Mt. Vernon, IN | Ethanol plant | 0 | 0 |
| 6 | 9/14/2021 | Derst Baking Co. | Savannah, GA | Baking plant | 0 | 2 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

TABLE 1. U.S. AGRICULTURAL DUST EXPLOSION STATISTICS

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | TEN YEAR TOTAL |
| Number | 10 | 7 | 7 | 8 | 5 | 7 | 12 | 11 | 8 | 6 | 81 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Fatalities | 0 | 1 | 0 | 0 | 3 | 5 | 1 | 1 | 1 | 1 | 13 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Injured | 8 | 7 | 14 | 10 | 8 | 12 | 2 | 8 | 6 | 5 | 80 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Type of Facility |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Grain Elevator | 8 | 3 | 5 | 2 | 2 | 5 | 8 | 4 | 4 | 3 | 44 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Feed Mill | 1 | 2 | 1 | 4 | 1 | 0 | 2 | 4 | 1 | 1 | 17 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Flour Mill | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Other: |  |  |  |  |  |  |  |  |  |  |  |
| Corn Milling, Dry | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Corn Milling, Wet | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Rice Mill | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Other | 1 | 1 | 1 | 2 | 0 | 1 | 2 | 2 | 1 | 1 | 12 |

Source: Dr. Kingsly Ambrose, Purdue University

TABLE 2. AGRICULTURAL DUST EXPLOSIONS BY COMMODITY HANDLED AT TIME OF EXPLOSION 2012-2021

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| COMMODITY | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | TEN YEAR TOTAL |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Corn | 6 | 5 | 3 | 2 | 1 | 6 | 6 | 5 | 2 | 2 | 38 |
| Soybeans | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 |
| Wheat | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 |
| Barley (malted) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Oats | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beet pulp | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Corn starch | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sugar | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mixed feed | 1 | 0 | 2 | 3 | 1 | 0 | 4 | 3 | 3 | 3 | 20 |
| Rice (Bran)(Flour)(Hulls) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| Wheat Flour | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wheat (Starch)(Gluten) | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| Other | 0 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 14 |
| TOTAL EXPLOSIONS | 10 | 7 | 7 | 8 | 5 | 7 | 12 | 11 | 8 | 6 | 81 |

Source: Dr. Kingsly Ambrose, Purdue University

TABLE 3. U. S. AGRICULTURAL DUST EXPLOSIONS LEADING STATES - 1958 to Date

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| STATE | 1958-2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 10-YEAR TOTAL | 1958-2021 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Iowa | 87 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 1 | 0 | 8 | 95 |
| Illinois | 76 | 1 | 0 | 1 | 1 | 0 | 0 | 2 | 1 | 1 | 0 | 7 | 83 |
| Nebraska | 75 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 6 | 81 |
| Minnesota | 58 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 2 | 8 | 66 |
| Kansas | 53 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 5 | 58 |
| Texas | 46 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 48 |
| Ohio | 35 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 3 | 38 |
| Missouri | 31 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 6 | 37 |
| Indiana | 27 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 7 | 34 |
| Louisiana | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 19 |
| South Dakota | 14 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 16 |
| Wisconsin | 7 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 6 | 13 |