

Your Home...



EXTENSION SERVICE
NORTH DAKOTA STATE UNIVERSITY
OF AGRICULTURE AND APPLIED SCIENCE

... WILL IT PROTECT YOUR FAMILY AGAINST *Radioactive Fallout?*

CIRCULAR A-435

OCTOBER 1963

Your home provides some protection against radioactive fallout. This circular will attempt to give you an idea how much protection your particular type of house offers and what improvements can be made to increase its protective value.

The protective value of a structure is referred to technically as its "protection factor". This is just a means of comparing fallout shelters of various kinds.

In this circular on page 3 are photographs of four types of houses found in every community. The "protection factor" for each is indicated. By comparing your home with one of these you have a rough estimate of the "protection factor" it may have.

SOME FACTS ABOUT FALLOUT PROTECTION

Radioactive fallout can cripple and kill, just as polio can cripple and kill. You are able to protect yourself and your family from polio through vaccine. You can protect yourself and your family from radioactive fallout by providing additional shielding for your home.

WHAT IS RADIOACTIVE FALLOUT

When an atomic weapon explodes it produces radioactive particles. These particles stick to the dust and debris that are sucked from the ground into the mushroom cloud. The dust cloud is blown downwind from the explosion. The dust particles then fall, like rain, to the earth's surface. These dust particles to which radioactive materials cling are radioactive fallout.

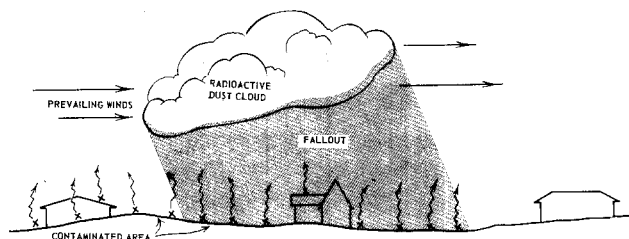


Fig. 1 - Radioactive material falls from a cloud in the form of dust.

WHAT IS RADIATION

The kind of radiation you will worry about first in case of a nuclear attack is called gamma radiation. Gamma radiation is the energy released by unstable atoms (radioactive particles) as they try to stabilize themselves. Gamma rays, like X-rays, can penetrate material, including your body. As they penetrate material they can damage or destroy living cells.

PROTECTION FROM RADIOACTIVE FALLOUT

Three things can protect you from radioactive fallout - time, distance and mass. Look at them, one at a time:

TIME - With every tick of your watch the strength of a radioactive particle is reduced. In the case of radioactive fallout, as the time increases by 7, the radioactive intensity decreases by 10. (See chart 1).

DISTANCE - The more distance between you and the source of radiation, the less exposure you will get. Two reasons for this are (1) the atoms in the air will stop some of the radiation, and (2) the farther you are from the source, the smaller amount of radiation you will receive.

CHART 1

Time elapsed from explosion	Radiation reduced to	Intensity of radiation
1 hr.		1,000 roentgens/hr.*
7 x 1 hr. = 7 hrs.	1/10	100 roentgens/hr.
7 x 7 hrs. = 49 hrs. or 2 days	1/100	10 roentgens/hr.
7 x 2 days = 14 days or 2 weeks	1/1000	1 roentgen /hr.

*Roentgens per hour is a measure of the intensity of radiation.

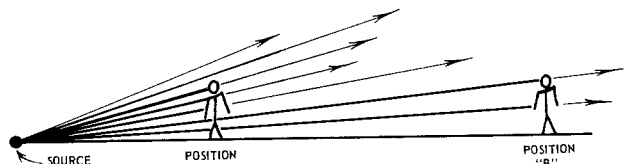


Fig. 2 - Position "A" (near source) intercepts, far more radiation than position "B" (some distance from source).

SHIELDING FROM RADIOACTIVE FALLOUT

Shielding means to get a mass of material between you and the fallout dust.

You need more shielding on the sides of a shelter than on the top because of radiation from the large amount of fallout that will settle to the ground around the building.

The heavier and denser the shielding material, the more protection it gives per inch of thickness.

In order to reduce the radiation to 1/100 of that on the outside see chart 2.

CHART 2

Material	Thickness necessary to reduce radiation to 1/100*
Concrete	16 inches
Soil	2 feet
Wood	5 feet
Wheat	4 feet
Oats	8 feet
Barley	5 feet

*This thickness also weighs about 200 pounds per square foot.

If you add material to the floor to increase the weight above the basement, don't overload your structure. The following chart gives you some upper safety limits.

CHART 3

Floor joist 16" on center and 14' long

Joist size	Allowable wt./sq. ft.	Depth			
		Soil	Oats	Barley	Wheat
2" x 12"	117 lbs.	14"	55"	36"	30"
2" x 10"	80 lbs.	10"	38"	25"	20"
2" x 8"	50 lbs.	6"	24"	16"	12"

Grain is included in the charts because it is available on many farms and it is easily moved. You could auger or shovel a foot or two of wheat onto the first floor of your house between the time the warning of a nuclear attack is received and the fallout starts coming.

Covering the first floor of your house with wheat, or any similar material and covering your basement windows with 100 pounds per square foot of shielding material (soil, sand, concrete, wheat, anything that is heavy) your basement will provide protection for your family as shown in chart 4.

Chart 4 considers both the mass of material and the distance from the roof and walls to the center of the basement.

NOTICE

An Office of Civil Defense fallout shelter in your basement will give you a protection factor of 100 or more.

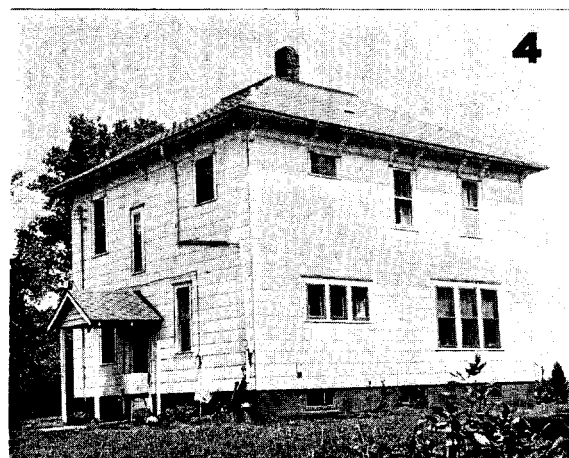
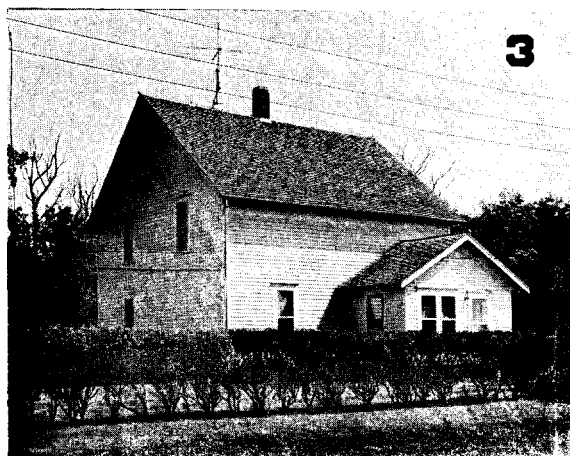
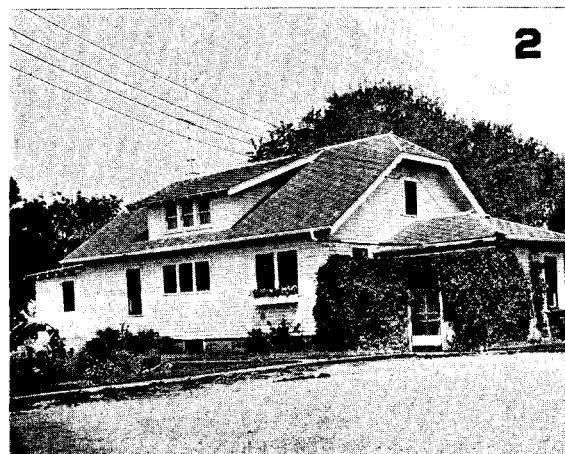
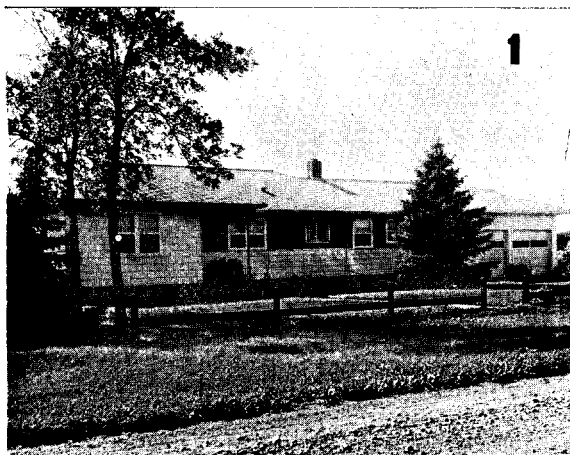
Call on your County Extension Agent, Home Extension Agent or County Civil Defense Director for additional information and shelter plans.

CHART 4

PROTECTION FACTORS* (In Basement)

	Basement windows		Basement windows shielded and grain covering 1st floor		
	As pictured	Shielded	50 lbs. grain	80 lbs. grain	117 lbs. grain
House No. 1	6	7	21	36	59
House No. 2	8	9	22	38	63
House No. 3	12	14	35	51	69
House No. 4	11	15	36	49	66

*Protection Factor (PF) is the proportion of radiation received in a protected position compared with that received outside. If the PF in a protected position is 10, you will receive 1/10 of the radiation you would receive in an unprotected position.



References:

The Family Fallout Shelter — Office of Civil Defense MP -
15
Family Shelter Designs — Office of Civil Defense H-7
Your Family Survival Plan — USDA Federal Extension
Service PA-578
Storage and Fallout Shelter-USD A — Ex. 5948 —building
plan
Farm Fallout Shelter and Storage — USDA — Ex. 5934 —
building plan
Fallout Shelter for Six People — USDA — Ex. 7166 —
building plan

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