

Scientists Against Nuclear Arms

Scottish Group



FACTSHEET No. 26

The scale of the severe, prompt effects of a single nuclear explosion
on farm animals, crops and forest trees

Scientists Against Nuclear Arms (SANA) is an independent organization formed in 1981 in response to the escalation of the arms race and the consequent danger of nuclear war. Its membership includes natural and social scientists, engineers and technologists, statisticians and psychologists.

Its purpose is to provide reliable and objective information on scientific and technical matters concerning nuclear arms and other weapons of mass destruction. It seeks to serve all sections of the peace and disarmament movement, Members of Parliament, local Councillors, Church and Trade Union leaders and others with influence upon public policy, and to inform the media and the general public.

It maintains contact and exchanges information with groups in other countries having similar aims.

Membership is open to all scientists - in the broad sense referred to above - who share its aims. Subscription is £12 a year (£3 for students, pensioners and unemployed). For further information send s.a.e. to the Secretary, Christopher Meredith, 8 Medland, Woughton Park, Milton Keynes, MK6 3BH

Explosive power of warhead ...1....Megaton
 Size of area lethal to farm crops + forests

Scientists Against Nuclear Arms

Scottish Group

Estimated scale of severe prompt effects of a single nuclear explosion				
Type of Effect	Details	Radius on map (mm)	Diameter on ground (miles)	Area on ground (acres)

1) EXPLOSION AT THE GROUND SURFACE.

<u>Crater</u>		4	1/4	30
<u>Blast</u>	90% trees blown down 30%	107 146	6 3/4 9	22,300 41,600
<u>Heat</u>	in moderately clear weather	133	8 1/4	34,200
	in unusually clear weather	165	10 1/4	52,600
<u>Nuclear radiation</u> (lethal to 50-100%)	crops trees	90 x 40 230 x 71	5 1/2 x 2 1/2 14 1/4 x 4 1/2	7 000 31,600

2) EXPLOSION IN THE AIR (Height above ground:- ~~1050~~/6800/14,700 feet)

<u>Blast</u>	90% trees blown down 30%	134 183	8 1/4 11 1/4	34,800 65,000
<u>Heat</u>	in moderately clear weather	166	10 1/4	53,400
	in unusually clear weather	206	12 3/4	82,300
<u>Nuclear radiation</u> (lethal to 50-100%)	crops trees	20 29	1 1/4 1 3/4	770 1600

- NOTES: - 1) Use these radii to prepare coloured translucent overlays for your local map of scale 1:50,000 (Divide them by 5 for regional maps of 1:250,000).
- 2) Areas are assumed circular, except for ellipses for nuclear radiation from fallout from a surface explosion.
- 3) Blast damage is considerably greater in built-up areas.
- 4) Heat damage: dry vegetation ignited in line of sight of the fireball, including spontaneous firestorms, with visibility at 10 miles, and 50 miles, respectively.
- 5) Nuclear radiation from fallout assumes a 15 mph steady wind from one direction, with no rain.
- 6) Conversions: miles x 1.6 = kilometres; acres ÷ 2.4 = hectares
 feet ÷ 3.3 = metres; mm ÷ 25 = inches.

MAIN SOURCE: Stockholm International Peace Research Institute "Weapons of Mass Destruction and the Environment", Taylor & Francis, London, 1977.
 (A comprehensive analysis of available U.S. Government information, books and articles in scientific journals.)

Explosive power of warhead *10 Megatons*

Size of area lethal to *50-100% of farm animals*

Scientists Against Nuclear Arms

Scottish Group

Estimated scale of severe prompt effects of a single nuclear explosion				
Type of Effect	Details	Radius on map (mm)	Diameter on ground (miles)	Area on ground (acres)

1) EXPLOSION AT THE GROUND SURFACE

<u>Crater</u>		8	1/2	140
<u>Blast</u>	in rural area	44	2 3/4	3800
<u>Heat</u>	in moderately clear weather	352	22	240,900
	in unusually clear weather	437	27 1/4	370,700
<u>Nuclear radiation</u>	exposed for the first 24 hours	1890 x 273	117 x 17	1,000,000

2) EXPLOSION IN THE AIR (Height above ground:- ~~1050/6000~~ 14,700 feet)

<u>Blast</u>	in rural area	59	3 3/4	6770
<u>Heat</u>	in moderately clear weather	441	27 1/2	377,500
	in unusually clear weather	547	34	580,700
<u>Nuclear radiation</u>	exposed for the first minute	55	3 1/2	5880

- NOTES: - 1) Use these radii to prepare coloured translucent overlays for your local map of scale 1:50,000 (Divide them by 5 for regional maps of 1:250,000).
- 2) Areas are assumed circular, except for ellipses for nuclear radiation from fallout from a surface explosion.
- 3) Blast damage is considerably greater in built-up areas.
- 4) Heat damage is for living organisms in line of sight of the fireball, excluding spontaneous firestorms, with visibility at 10 miles, and 50 miles, respectively.
- 5) Nuclear radiation from fallout assumes a 15 mph steady wind from one direction, with no rain.
- 6) Conversions: miles x 1.6 = kilometres; acres ÷ 2.4 = hectares
feet ÷ 3.3 = metres; mm ÷ 25 = inches.

MAIN SOURCE: Stockholm International Peace Research Institute "Weapons of Mass Destruction and the Environment", Taylor & Francis, London, 1977. (A comprehensive analysis of available U.S. Government information, books and articles in scientific journals.)

Explosive power of warhead **.10...Megatons**
 Size of area lethal to **farm crops + forest trees**

Scientists Against Nuclear Arms

Scottish Group

Estimated scale of severe prompt effects of a single nuclear explosion				
Type of Effect	Details	Radius on map (mm)	Diameter on ground (miles)	Area on ground (acres)

1) EXPLOSION AT THE GROUND SURFACE

<u>Crater</u>		8	$\frac{1}{2}$	140
<u>Blast</u>	90% trees blown down	259	16	129,700
	30%	375	$23\frac{1}{4}$	273,600
<u>Heat</u>	in moderately clear weather	311	$19\frac{3}{4}$	187,900
	in unusually clear weather	386	24	289,000
<u>Nuclear radiation</u>	(lethal to crops 50-100%); trees	220 x 70 640 x 127	$13\frac{3}{4} \times 4\frac{1}{4}$ $39\frac{3}{4} \times 8$	29,900 157,700

2) EXPLOSION IN THE AIR (Height above ground:- ~~1050/6000~~ 14,700 feet)

<u>Blast</u>	90% trees blown down	323	20	202,600
	30%	469	$29\frac{1}{4}$	427,500
<u>Heat</u>	in moderately clear weather	389	$24\frac{1}{4}$	293,900
	in unusually clear weather	483	30	452,200
<u>Nuclear radiation</u>	(lethal to crops 50-100%); trees	31 40	2 $2\frac{1}{2}$	1880 3090

- NOTES: - 1) Use these radii to prepare coloured translucent overlays for your local map of scale 1:50,000 (Divide them by 5 for regional maps of 1:250,000).
- 2) Areas are assumed circular, except for ellipses for nuclear radiation from fallout from a surface explosion.
- 3) Blast damage is considerably greater in built-up areas.
- 4) Heat damage: dry vegetation ignited in line of sight of the fireball, including spontaneous firestorms, with visibility at 10 miles, and 50 miles, respectively.
- 5) Nuclear radiation from fallout assumes a 15 mph steady wind from one direction, with no rain.
- 6) Conversions: miles x 1.6 = kilometres; acres \div 2.4 = hectares
 feet \div 3.3 = metres; mm \div 25 = inches.

MAIN SOURCE: Stockholm International Peace Research Institute "Weapons of Mass Destruction and the Environment", Taylor & Francis, London, 1977. (A comprehensive analysis of available U.S. Government information, books and articles in scientific journals.)

FAMOUS LAST WORDS

... overheard by Arthur Horner ...



My dear it's so terrible I'm sure it'll never be used . . .

"The effects of a nuclear war that cannot be calculated are at least as important as those for which calculations are attempted"

US Congress, Office of Technology Assessment



Further details and copies available from 67 Warrender Park Road,
Edinburgh - Scottish Group of SANA