

Can I protect my farm?**How does radiation affect crops and livestock?****What about the Nuclear Winter?**

"Home Defence and the Farmer" was first published in 1958 and is out of date. The Government is preparing a new version but will not give a publication date. The following information has been obtained from a booklet published by farmers on the subject: "A Guide to the Effects of Nuclear Disaster on Agriculture", which is available from Brendan Butler, Lower Westcott Farm, Moretonhampstead, Devon. The price including postage is £1.22.

Radiation cannot be detected by human senses because it is odourless, colourless and tasteless. There is no effective antidote. Exposure to radiation is measured in rads. 10 rads per year is the limit before an area is to be evacuated in peacetime. In wartime, according to the Home Office leaflet entitled "Protect and Survive" the 'all-clear' will be sounded when radiation is at 10 rads per working day.

Nuclear radiation is of three types: gamma rays that damage from a distance by external radiation; beta particles that damage by contact with skin, mouth, lungs and gut, causing burns; alpha particles which are dangerous if eaten or inhaled.

Animals grazing in fields are most at risk because fallout will land on their coats and will contaminate pastures. When they lie down particles will get on their udders and genitals causing beta burns.

Housing in a sealed building would provide the best chance of survival but this presents practical problems. How could you store enough uncontaminated food and water in the building? How could you ventilate it and muck it out when supplies of electricity and clean piped water had ceased?

If milking cows are to be saved the herdsman will have to shelter in the cattle yard with his stock and milk them. Since even conscientious stockmen would want to be with their families milking would be abandoned and today's high-yielding cows would quickly succumb to mastitis. If any cows were handmilked great care would need to be taken to ensure that radioactive fallout did not get into the milk. If cows eat or drink food contaminated with fallout the radioactive particles will pass through their bodies and contaminate the milk. Iodine 131 is especially dangerous because it has a rapid transfer into milk and if ingested it concentrates in the thyroid and causes cancer. If milk contaminated by fallout is made into cheese the radioactivity will decline as the cheese matures but it will not disappear.

In the case of eggs most of the radioactive contamination will be in the shell, so eggs would be relatively safe to eat but it is unlikely that they could be produced in sufficient quantities. Battery hens will not become free range overnight and if, as seems likely, there will be a dramatic drop in temperature and sunlight, they will stop laying anyway.

It is likely that intensive beef and pig production would cease due to lack of food, except for small numbers on rough grazing.

Sheep might fare better than cattle since their wool gives protection and the rough grazing on land that had become derelict

would suit them.

Heat, blast and radiation, the loss of mains services and the lack of veterinary surgeons and their drugs will cause enormous livestock losses. Virtually all intensive livestock will perish even in an area of low blast because of failure of electricity and water supplies. Large numbers of intensively reared pigs, chickens and calves would either have to be killed or left to starve or let out to roam and pick up what feed they could. As the damage done would be enormous the best course would be to kill them but it is unlikely that there would be spare ammunition for this purpose so they would have to be clubbed to death. There would be no fuel for mechanical diggers so the people involved would be working with contaminated topsoil. (Imagine a Foot and Mouth slaughter by hand.)

Problems of disease, rats and flies whose resistance to radiation is higher than livestock or humans would become so acute that the farms would become intolerable for surviving humans and they would have to be abandoned.

Radiation affects all living cells, and plant cells are affected in much the same way as animal cells. The damage done depends on the severity of the exposure, the stage of growth of the plant and growing conditions after exposure.

When nuclear radiation passes through a plant or when fallout settles on it, it damages or destroys the cells which make it up. The higher the dose of radiation the plant is exposed to the more cells are destroyed and so it becomes sick and stunted and will die. Crops vary as to their lethal dose of radiation. Peas and beans are most vulnerable while barley and wheat are in the medium range and beet, potatoes and tomatoes have a higher tolerance.

Perhaps the most important factor is the stage of growth of the plant when it is exposed. Cells that are rapidly dividing are most vulnerable to radioactivity so if a plant is exposed at the young growing stage or the flowering tip stage the crop yield will be severely affected. Seeds, because they are dormant and buried are less vulnerable but if they are exposed they will be genetically damaged. An attack in winter would result in the loss of the winter sown wheat and barley seedlings but it might be possible to re-drill three months later with spring varieties if seed survived. An attack in spring when plants are young and vulnerable and there is no second chance could result in a total crop loss. An attack in mid-season as seed heads are developing could also result in heavy losses. An attack in harvest time would not affect the plant yield but the radiation levels might be too high for the crops to be harvested in time and delays would result in the crop lodging and rotting.

Ploughing of contaminated topsoil would need to be done before any replanting could begin. This would be very dangerous for the ploughman who would be exposed to radioactive dust unless in a completely sealed cab.

Unfortunately, plants and trees that survive the initial fallout will be the ones that take up radioactivity from the soil and thereby become poisonous to humans and animals. No amount of washing of the fruit would remove this contamination.

Atomic tests were held in Bikini in the late 1950's but the

evacuated islanders were told in 1983 that they could return provided they ate no home grown food until around 2070.

When radiation passes through water it does not make it radioactive - it is the particles that fall into it that create the danger. If these can be allowed to settle or be filtered out in some way the water will become much less contaminated. Farms with deep wells will be better off as will those in areas with a high water table since wells can be dug and as the water seeps through to the well it will be effectively filtered. Otherwise water from fast-flowing streams, the nearer the source the better, can be filtered through a five gallon drum with holes punched in the bottom. This could provide two to four pints of clean water per hour or about thirty gallons before the filter became blocked. In the first months it would be very dangerous to collect rain or snow as these will contain dangerous radioactive particles gathered in their fall. Shallow pools would be highly contaminated. Deep pools and reservoirs would be safer once the fallout had settled to the bottom if they could be tapped without stirring up the sediment.

So far nothing has been said about the nuclear winter which scientists have recently come to realise will follow a nuclear war. Because of the large amount of carbon debris in the atmosphere the sun's rays will be blocked and climatic changes will take place. Within three or four weeks all areas except the coastal strips could experience temperatures of -23C and the temperature would remain below freezing for 70 days after a 100 megaton war, 90 days after a 500 megaton war and 170 days after a 1000 megaton war. All fresh water would be frozen and the ground frozen to a depth of one to two metres. After a 5000 megaton war it would be a year before temperatures returned to normal. Weather patterns would be altered because the very cold land next to the warmer sea would create a large temperature gradient that would produce violent storms, particularly in the coastal strips, and heavy falls of snow further inland even in summer.

The implications of this are very serious. If the bombs exploded in spring there would follow a continuous period of winter lasting a year and a half. Only if the attack were in the autumn and the nuclear winter and normal winter coincided would there be any hope of crop survival. An attack at any other time would result in the total loss of the harvest over the whole of the northern hemisphere, an event unprecedented in the history of man.

It is frequently said that nuclear weapons have preserved the peace in Europe for 40 years. It would be more accurate just to say that during that period they have increased in number and destructive power and that they have not been used mistakenly or accidentally - or deliberately - yet.

Further information on nuclear weapons and their prevention can be obtained from: The Secretary, Strathearn CND, 13 Cairns Court, Crieff. Tel: 3874