

adjacent field that would be wide enough to avoid contaminating the nontarget field.

LONG RANGE DRIFT IS NOT PREDICTABLE

Long range drift of small droplets is not predictable because a small droplet does not always fall while suspended in air. Air can have a vertical velocity component which is generally upward during the middle of the day when the warm air at ground level is displaced by the cooler, heavier air above it. The vertical updraft can cause a friction force on a small droplet that is greater than the droplet's weight. When the upward force exceeds the droplet's weight, the droplet will rise rather than fall. To make matters worse, the weight of a spray droplet reduces over time because water (most spray droplets are predominantly water) in the droplet evaporates.

A small droplet will remain airborne until the air mass transporting the droplet is calm long enough to allow the small downward force of gravity to cause it to settle to the ground. Because weather is unpredictable, accurately predicting where a small airborne droplet will eventually land is essentially impossible. The location is largely a matter of chance. There are computer models used to determine where droplets will settle under given environmental conditions. These models predict the paths taken by the larger droplets, but are not very accurate when predicting where the small droplets settle out. These programs are useful for determining how wide a buffer zone should be to keep swath displacement from causing problems in nearby fields. Fortunately the residue level that accumulates because of long range drift is usually very low and often undetectable.

Whether the low level of chemical that results from long range drift constitutes a problem depends on who is asked. There are some people who feel that chemicals settling on nontarget areas at any level is a problem. If the only acceptable level of drift into nontarget areas was zero, all spray operations would have to be shut down along with many industrial operations. There is no such thing as "zero drift" for any operation where small particles are released into the atmosphere. Even large objects are displaced some small amount when falling in air that has an horizontal wind velocity. However, it is possible to keep drift to a such a low level that the benefits from applying a chemical exceed the potential risks in the minds of most rational people. If this were not so, the application of the chemical would not be allowed by

the Environmental Protection Agency (EPA), the agency that regulates agricultural pesticides.

DRIFT CAN OCCUR AT THE TIME OF APPLICATION OR LATER

Chemicals can drift from the target area and cause a drift problem at the time of the application or at some time after the application. Drift that occurs after the application are caused by: (1) having the dry residue of a wettable powder applied as a spray blown into an adjacent area after the water carrier evaporates, (2) having chemical vapors transported downwind or (3) having high winds blow pesticide-treated soil and plant particles from the target field into a neighboring area some time after the chemical was applied. Contamination resulting from a chemical being transported into nontarget areas hours or even days after application are an oddity. Very few of the problems caused by drift have resulted from "post application" drift. This publication is primarily concerned with the drift of particles that begin their flight into neighboring areas at the time of application. This is the type of drift that is most prevalent and deserves most of the attention.

DRIFT AND DRIFT PROBLEMS

There is a difference between drift and drift problems. Virtually all spray applications result in some small amount of spray drifting beyond the immediate target area. This does not mean that the drift has created a "problem".

The chemical may drift from the target area onto an area totally within the holdings of the person applying it. This person probably would not consider the drift to be a problem. If the chemical drifts onto a nontarget area not totally within the holdings of the person applying it and the residue level is too small to cause an immediate effect (offensive odor, illness of residents, damage to plants, etc.), there probably will not be a problem caused by the drift. Chemicals used in today's agriculture are less likely to accumulate in the soil or water because the pesticides that are used are degraded by the effects of sunlight and soil microorganisms. Rapid degradation without accumulation of a chemical or its breakdown products is a major consideration in determining whether the chemical can be used as a pesticide.

For example, chemicals that remain as toxins in the environment for a long time (years in some cases) are known as persistent pesticides and the use of this