

No-spray zones, the controversy

The concept of no-spray zones separating sprayed fields from residential areas to protect human health has been highly contentious in the UK. Introduction of such zones has recently been recommended by independent science advisors to the UK government but dismissed by its pesticide advisors. Clare Butler Ellis examines the issues.

Campaigns by Georgina Downs and PAN UK have focused attention on the health concerns of rural residents living next to sprayed fields in the UK. In 2003 their concerns prompted then Minister for Rural Affairs, Alun Michael to request the Royal Commission for Environmental Pollution (RCEP) to conduct an independent assessment of the issue [PN70, p8]. One of the RCEP's recommendations¹ resulting from the enquiry was for an interim buffer zone next to residential property and other public buildings, while the model currently used for assessing risks to residents and bystanders is reviewed. The suggested size of the buffer zone was five metres for a conventional boom sprayer, with unspecified distances needed for other types of sprayers.

However, the UK government's Advisory Committee on Pesticides (ACP) have recently published their response to the RCEP report². In this they indicate they are 'unconvinced by the scientific case for a precautionary 5m buffer zone' which they believe 'has no clear rationale, and would be a disproportionate response to uncertainty.'

So should there be additional measures to reduce the potential exposure of the public to pesticides and are buffer zones an appropriate way to achieve this?

Reducing public exposure

The ACP argues that, since pesticides are approved only if they are sufficiently safe under a worst-case exposure scenario, there is no need for further measures to reduce exposure. However, there are questions about whether the exposure scenario they use is genuinely worst case – does it truly represent current spraying practice and does it adequately take account of uncertainties? In particular, it assumes a distance of eight metres between the sprayer and the person, something which is clearly not the worst case.

The recently-revised Code of Practice³ for pesticide users states that the law⁴ requires them 'to consider the best way to protect anyone who might be exposed to pesticides by preventing the exposure or adequately controlling it.' In addition, because of the impossibility of proving that a chemical is safe, the precautionary principle suggests we should not rely on the limits of current knowledge, but should try to build in some protection against the unfore-

seen. The public are aware that science is not black and white, and that their protection cannot be guaranteed. How far we take the precautionary principle is a political, not scientific question.

Given inadequacies in the current exposure assessment and our inability to guarantee safety, legislative requirement and public demand, some reasonable, practical steps to reduce exposure are fully justified.

Public exposure to spray drift

The public may be exposed to pesticides in different ways:

Overspray

A person is likely to receive the highest exposure if directly sprayed with the full dose of a pesticide. This can happen if a spray operator is careless about where the edge of the spray is. If there is some wind, then the entire spray can be shifted slightly downwind⁵. A buffer zone of two metres, such as is required by new rules⁶ to protect hedges, will essentially eliminate the chance of accidental overspray, providing the operator takes the necessary care. This is the minimum distance needed to ensure that the Code of Practice is complied with, in terms of confining the application to the area to be treated.

Spray Drift

Drifting spray droplets occur during application when cross-winds carry droplets away from the target area before they reach the crop. A plethora of data shows that ground contamination by spray drift reduces with downwind distance. This shows that, for boom sprayers, a buffer zone of five to ten metres would contribute significantly to reducing drift, particularly if the vegetation within it is chosen carefully.

Spray drift close to the sprayer is strongly influenced by a wide range of variables, such as wind speed and sprayer nozzles⁷. However, this influence declines with distance from the sprayer, and by five metres the drift and the variability is much lower. Although similar data on airborne spray is lacking, evidence has been presented showing comparable effects of increasing distance⁸. The worst case scenario in the exposure assessment needs to take this into account, leading to much greater maximum

exposures close to the sprayer than would occur at five metres.

Vapour, particles and dust

For some time after application pesticide-vapour, or particles or dust contaminated with pesticide can all become airborne. However, the degree to which this happens, and the subsequent dispersion of the pesticide downwind is not well known. Without this, it is difficult to speculate about how big a 'vapour' buffer zone should be. The concentration of vapour downwind of a sprayed field will be very dependent on chemical properties of the pesticide formulation – especially vapour pressure – and environmental conditions.

No-spray zones can help

Five metres is large enough to eliminate the risk of overspray, reduce the uncertainty in the spray drift exposure estimate and reduce the actual exposure from spray drift by at least 50%, and potentially much more. Moreover, it will guard against unforeseen circumstances, such as a sudden gust of wind, a change in wind direction, faulty equipment or human error that might lead to unexpectedly high levels. Ten metres would clearly provide an additional margin of safety.

Is a five metre buffer zone 'disproportionate'? Buffer zones are now commonplace for hedgerows (two metres) and water bodies (up to five metres) and therefore it is difficult to argue that five metres is too great a burden for farmers. There are no other precautions recommended for reducing people's exposure and therefore this one measure is possibly the least that can be done. There will be other methods of controlling exposure and a buffer zone may not be the best solution in every case, but a blanket denial that they have any rationale at all looks like an increasingly untenable position in light of the evidence. (CBE)

References

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