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AABS/KM

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Dear Ivor,

During my visit to Jealott's Hill last week I did not quite finish discussing the suggestion made in your letter of October 22nd that some emetic substance might be added to paraquat formulations. The only two pharmacological means of inducing vomiting that have to be considered are by compounds which act directly on those parts of the central nervous system that set the whole complex of vomiting movements into action, and compounds which have a local irritant action on nerve endings in the stomach and upper intestine which activate the vomiting mechanism by reflex action. The first group, which consists solely of apomorphine and some other related morphine derivatives, can be dismissed. They take at least 30 minutes to act as they have to be absorbed from the gut, and there is therefore time for dangerous amounts of paraquat or other pesticides to be absorbed as well.

The only effective local emetics which act quickly enough, i. e. within a few minutes, are salts of heavy metals like copper or zinc sulphate. They must be given in approximately 1% solution, so if incorporated in a granule they would probably have to be present in an amount nearer 5% to be effective. I think the cost of copper is such that, technical considerations apart, this would not make economic sense in attempting to cope with what is, in fact, a rare event, although it has attracted such potentially damaging publicity. I imagine there would be serious technical objections to the incorporation of a zinc salt with paraquat, so that this is not a feasible proposition either. None of the other local irritant emetics (such as the alkaloids from ipecacuanha) seem to be any more rapid in inducing vomiting than paraquat itself, which of course has a quite powerful local irritant action of its own, and their cost would be prohibitive.

Considering that the alternative of inducing vomiting mechanically (provided someone is at hand to put a finger down the throat) is most rapid of all and costs nothing, I doubt if your suggestion is worth pursuing for paraquat, but it is one that we might do well to keep in mind, particularly for domestic gardening formulations that are compatible with zinc salts.

Yours sincerely,