Ethephon/pineapple: MRLs on the move

European standards concerning the maximum residue limit (MRL) for ethephon on pineapples are being reconsidered. In July 2001, the ceiling is to be changed to 0.5 mg/kg but may subsequently be increased to 2 mg if this limit is approved by the Codex alimentarius. This stop-and-go pattern clearly illustrates the complexity of the situation resulting from insufficient scientific knowledge of the technical components of the problem and the interference of numerous economic aspects. It first of all concerns producers in Côte d'Ivoire, the main suppliers of the European Union.

Widely used in agriculture, ethephon breaks down and produces ethylene which influences numerous physiological phenomena that are dependent on the gas, a natural plant growth regulator. The local climatic conditions in Côte d'Ivoire make it possible to grow sweet, well-flavoured pineapples but the relative low insolation, especially at certain times of the year and in certain regions, and the small difference between daytime and nocturnal temperatures, do not favour the natural destruction of chlorophyll. Thus, Côte d'Ivoire pineapples, like those of other more equatorial than tropical countries, can be sweeter and have more flavour than those of other origins but are less coloured. Ethephon is therefore used as the pineapple crop approaches to speed up the breakdown of the epiderm chlorophyll whose presence masks the orange pigments naturally present. This treatment induces intense, uniform colour that is difficult to obtain naturally. As European market demand has been clearly aimed at the best-coloured fruits for a number of years, growers in Côte d'Ivoire have had to use ethephon on a systematic basis to improve the appearance of their fruits.

An MRL with little scientific justification

The new MRL values for ethephon seem unjustified in the eyes of growers with regard to both the technical and health aspects and political and commercial considerations. In particular, the figure of 0.5 mg/kg is reported to have been determined during experiments outside Côte d'Ivoire or using agricultural practices that do not correspond to the present technical and economic context but rather to that of the 1970s. Demand for coloured fruits was not as strong at that time and the sole objective was that of reducing the number of rounds required to harvest all the fruits in the same field. Application was performed late with small doses that did not give fruits with strong external colour during all seasons and in all places.

Ethephon penetrates pineapple very little and the residues are the result of complex, poorly known balances between penetration, runoff, deposits on the peel, possible redissolving and fresh penetration and internal and external degradation. Climatic factors play a preponderant role in these balances and the residues found in fruits after the same dose can vary in scale from 1 to 10!

The search for minimum residue levels in foodstuffs is an unavoidable necessity. Change can only be towards increasing demand for this, and towards increasingly strong condemnation of deviations in agricultural practices that would be opposed to it. However, will the external appearance of fruits continue for a long time to outweigh their taste and health qualities as a major determinant of their commercial value? In comparison with pineapples of other origins, should those of the equatorial zones be criticised because they are less coloured even though they may have better taste qualities?

Our knowledge of the relations between pineapples and ethephon are inadequate and much experimental work is needed at all stages in the chain. Here, the mobilisation of all operators would illustrate their determination to improve their technical skills to respond to the preoccupations of both consumers and lawmakers and also to market constraints. The following are needed in particular:

- the scientific development of a missing feature: good agricultural practices responding to the new market constraints and taking the taste quality of the fruits into account;
- data gathering under varied climatic conditions;
- determining control procedures.

The studies should be undertaken without an a priori option for a particular MRL. The level to be defined a posteriori would thus correspond to technical and economic reality and would probably be seen to be more coherent with the levels laid down for temperate fruits.

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Two different scales

A 0.5 mg/kg standard might also seem surprising in the light of the low toxicity of ethephon and the site of residues, with 80% on the surface of pineapple peel. It seems shocking and unjust in comparison with the MRLs for temperate fruits whose peel is eaten and which form a larger part of the European diet than pineapples.

A practice that can go astray

European market pressure for coloured fruits, the complexity of marketing in particular with regard to the need for refrigerated shipping facilities and the fear of quality problems that are always more frequent in ripe fruits have sometimes led growers to increasing the doses applied and treating fruits that are still too far from their point of optimum ripeness. Such a practice meets their expectations but can seriously affect the taste quality of the fruits, leading to a decrease in the sugar content and an increase in acidity among other things.