

# All about Preharvest interval (PHI) and its significance in agricultural trade

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The awareness about Preharvest interval (PHI) for pesticides application is almost completely absent among the farmers in developing countries. This often leads to avoidable rejections of agricultural exports to developed countries.

## **What is Preharvest interval (PHI)?**

The PHI is the minimum wait time, in days, between the last application of a pesticide and when it can be harvested for consumption/marketing. Each pesticide label carries the information regarding the applicable PHI which differs from one crop to another. Typically, the PHI can range from 1 or 2 days to as high as over 60 days. The PHI allows enough time for the pesticide concerned to breakdown in the plant without leaving residues beyond the Maximum Residue Level (MRL). The MRL is the maximum acceptable level of residues of a pesticide that is legally tolerated in food and agricultural products when they are traded. It is often measured and expressed in terms of parts per million (ppm or mg/kg). Complying with the PHI is therefore mandatory and important to meet the MRL.

## **How does PHI gradually lead to decline in the pesticide residues?**

Here is an example. This graph shows how the residues of Acetamiprid fall to the level of MRL in cabbage. The residues of Acetamiprid declined 150% in 14 days from 2.69 ppm to 1 ppm. The cabbage can be harvested after 14 days.

## **How is the PHI determined?**

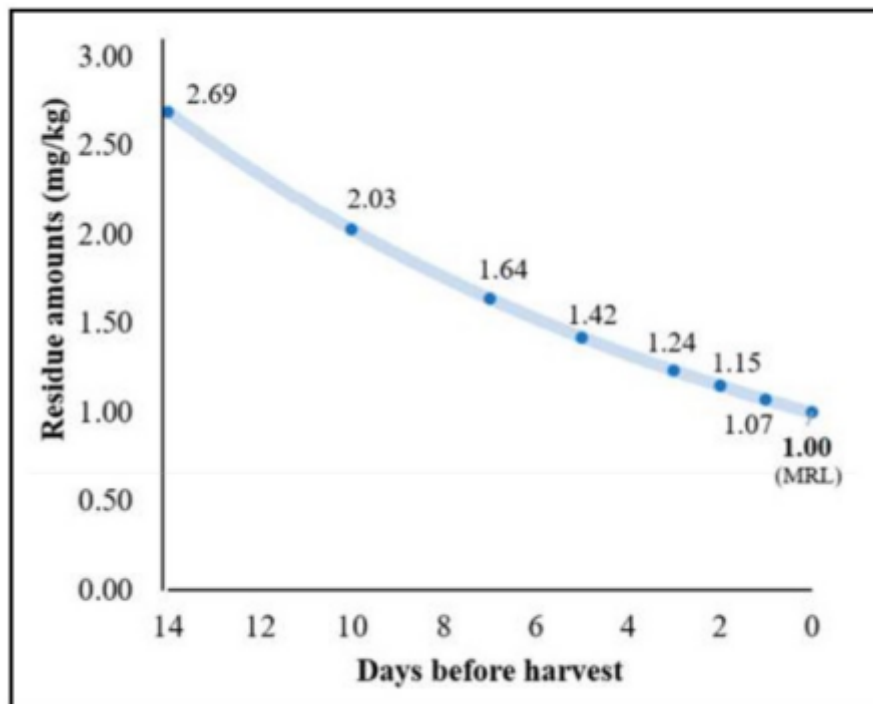
The first step to determining the PHI for a pesticide is to determine the MRL for that pesticide in the crop concerned. Extensive studies will then be conducted to assess

how much time (in days) it takes for residues to decline to reach the MRL taking into consideration the country specific Good Agricultural Practice (GAP).

Dissipation of residue levels for a given pesticide on a crop is influenced by local environmental

conditions, microbes present on the plant surface and in the soil, rains, sunlight, temperature etc. Microbial organisms mineralize the pesticide residues into final small molecules such as CO<sub>2</sub>, water and minerals. It is important to remember that the PHI will not be uniform for all the crops for a given pesticide.

**Pre-harvest residue dissipation curve**



Source : <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6680825/>

### Importance of PHI

The PHI gives farmers the required information to ensure that the residues of pesticide in the treated crop will not exceed the MRL. If farmers apply two or more pesticides together (tank mix), then the one with longer PHI matters. The pesticide label carries information concerning the PHI. If pest attack close to harvesting requires pesticide application, the choice should be limited to pesticides with short PHI.

Pesticide residues in the traded agricultural commodities beyond the MRLs have emerged to be a major non-tariff barrier (NTBs) in the international trade. Strict adherence to the PHI would ensure that the exported products do not face rejections. Data available from the European Union (EU) shows that in the six months between January 2023 till June 2023, the EU had notified /rejected as many as 471 consignments of food products on account of MRL violations. A vast majority of these were exported from developing countries.

It is essential that efforts are taken especially in the developing countries by the regulators, extension workers, exporters, and agrochemicals industry to enhance the awareness about the PHI among the farmers. Strict adherence to the PHI will avoid rejections in the international markets on account of MRL violations.

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