



MPS-MIND

1 Introduction

In the context of MPS qualification, the quantity of active substances utilised by growers in crop protection agents is a key determinant for qualification points assigned to crop protection. However, it is crucial to recognise that each active substance does not exert an identical environmental impact. To address this variability, MPS-MIND (Milieu-INDicator or Environmental INDicator) has been developed.

MPS-MIND distinguishes crop protection agents based on their environmental impact, categorising them as red, amber, or green. Crop protection agents with a low environmental impact per kilogram are designated as green, while those with a higher environmental impact per gram are categorised as red.

The environmental score of a plant protection agent is based on two factors:

1. The environmental impact of the plant protection agent itself.
2. The quantity in which it is used.

To illustrate, a crop protection agent may be highly toxic, but if applied in low concentrations, its impact on the environment remains minimal. Conversely, a less toxic pesticide, when used frequently and in substantial quantities, can have a more profound and devastating effect on the environment. This implies that employing a less toxic pesticide in significant quantities can yield an impact comparable to that of a highly toxic pesticide.

In the MPS ABC system, where points are awarded based on adherence to environmental best practices, growers are incentivised to employ the lowest possible quantity of crop protection agents. The emphasis is not only on reducing pesticide usage but also on selecting agents with a lower environmental impact. This approach underscores a holistic consideration of environmental impact rather than solely focusing on quantity reduction.

1.1 Aim of MPS-MIND

- MPS-MIND aims to provide MPS growers with information about the differences in environmental impact of the crop protection agents used.
- MPS-MIND stimulates growers to use as little crop protection (kg active substance) as possible, with the lowest environmental risk.
- MPS-MIND indicates the potential environmental risk of crop protection. It is not an instrument to measure the actual environmental impact and it is certainly not a replacement for official danger signs on packaging.

1.2 Classification factors

The classification of the crop protection agents is based on the following factors:

1. Toxicity: for humans, animals, birds, aquatic life, soil life, and natural predators. Both acute and long-term (chronicle) effects (e.g. carcinogenic potential).
2. Persistence: the longer an substance exists, the greater the risk that the substance's harmful characteristics will affect humans and the environment. Persistence takes into account the decomposition rate and/or the accumulation of the active substance in the Foodchain.
3. Potential mobility: the risk of spreading through water and through air. With a high mobility there is a greater risk for health and nature outside the agricultural systems.
4. Location factors: the environmental impact of crop protection also depends on company characteristics and location factors (indoor/outdoor, substrate, recirculation, temperature, annual rainfall, distance to surface water etc.). These factors are taken into account during the different calculations.

1.3 Calculation model

The calculation model involves quantifying various components. MPS refrains from directly assessing the crop protection agents. Instead, only information sourced from reliable sources is accepted and utilised. For the calculations, the most reliable parameters available to articulate the risk associated with each component are gathered. These parameters might include specific chemical attributes of the substance or its classification in another indicator, such as risk phrases and health hazard indications.

2 Assigning MPS-MIND colours

Figure 1 shows the process of assigning colours to active substances. Based on the E-score a green, amber or red colour is assigned to the different active substances of crop protection agents. White is assigned manually to active substances that exhibit either no or very minimal potential environmental risk, while a black colour is assigned manually to the active substances mentioned in the MPS-List prohibited active substances. The MPS-List prohibited active substances contains the active substances that are not allowed to use by MPS growers.

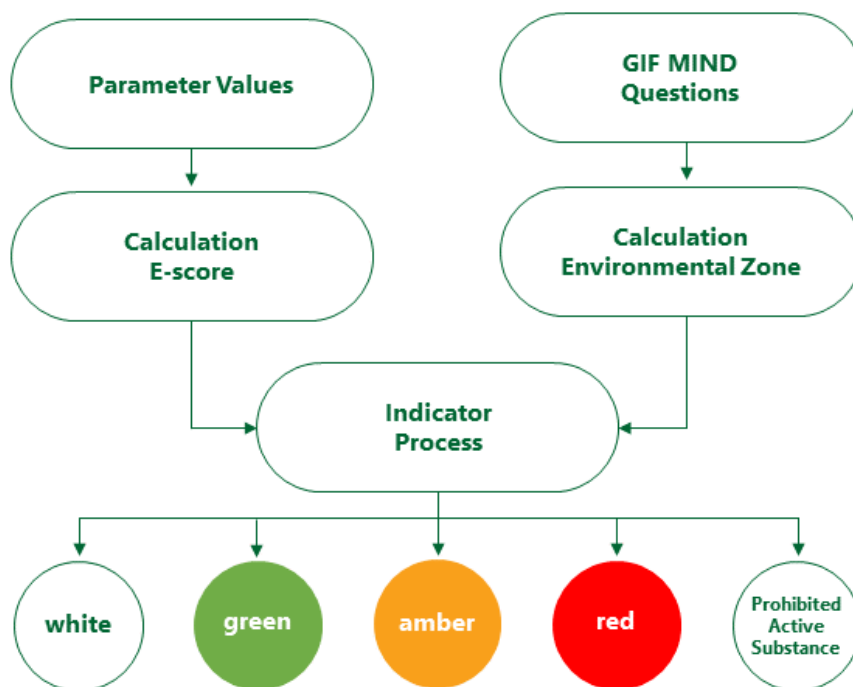


Figure 1: schematic overview assigning colours

3 E-score

The E-score is calculated to assign a colour to an active substance, with a higher E-score indicating a correspondingly elevated potential risk associated with the active substance.

$$E\text{-score} = (\text{Toxicity} + \text{Persistence}) * \text{Mobility factor}$$

The score for toxicity consists of 6 components.

Toxicity	Max points
Mammalian/human	10
Chronic effects	10
Bird	10
Effect on beneficial organismal	10
Soil life	10
Aquatic life	10
Total	60

The score for persistence consists of 2 components

Persistence	Max points
Decomposition speed	30
Bio-accumulation	20
Total	50

The mobility factor consists of 2 components

Mobility factor	Range
Based on:	0,8-2,0
50% mobility in water	
50% mobility in air	

4 Environmental zone

Location factors influence the environmental risk potential when using crop protection agents. The presence of (surface) water and emission control are the most influential factors. The following location factors were ultimately found to be significant and auditable.

- The distance to the nearest surface water
- Covered cultivation
- Windbreak or barrier crop
- Depth of the groundwater in connection with leaching
- Slope of the plot in connection with run-off
- Soil type in connection with leaching
- Annual rainfall and distribution of rainfall
- Average temperature

To allow location factors to be taken into account in the MPS-MIND qualification, companies with comparable location factors are divided into groups, called Environmental Zones. Each company is classified in an environmental zone based on a location questionnaire in the MPS-ABC record-keeping environment.

The MPS Environmental zones

1. **Environmental zone 1:** Dry environment where the effect on water life and soil life is not significant. Mobility in water is less important than mobility through air.
An example is a closed system on a very dry location.
2. **Environmental zone 2:** Dry environment where the effect on water life is not significant, but the effect on soil life is slightly significant. Mobility in water is less important than mobility through air.
An example is a non-closed system on a very dry location.
3. **Environmental zone 3:** Environment where the cultivation is effectively shielded from surface water and soil. However, the product can come into contact with water life through vapour. Mobility in water is less important than mobility through air.
An example is cultivation in a closed system in an environment that contains surface water.
4. **Environmental zone 4:** Environment where cultivation is shielded from surface water, but not from soil and groundwater. Or there may be a direct discharge into surface water. Mobility in water through air is equally important in this model.
An example is a non-closed system in glasshouses or a relatively dry environment.
5. **Environmental zone 5:** Cultivation is separated from the surface water to some extent, but not from soil and with high groundwater levels. Mobility in water is more important than mobility through air in this model.
An example is a non-closed system in an environment with a lot of water nearby, or where the land is screened beside surface water using glasshouses or (wind) screens.
6. **Environmental zone 6:** Open cultivation in areas with a lot of surface water and a high groundwater level. The effect on water life and the risk of leaching both play a significant role in the assessment.
An example is nursery stock or bulb cultivation on a location with abundant water.