

## THE USE OF TRIAZINE HERBICIDES IN INTEGRATED PRODUCTION OF WINE (IPW) IN SOUTH AFRICA

Pre-emergence herbicides belonging to the triazine group (active ingredients like simazine, atrazine, terbuthylazine) have been banned from agricultural use in several countries in Europe, due to environmental concerns, primarily contamination of water sources. This raises questions about the continued use of triazine herbicides in IPW in South Africa.

Two triazine compounds/actives are registered for use in vineyards in South Africa, namely simazine and terbuthylazine. The following facts should be considered:

1. The banning of triazines in the EU was precipitated mainly by the contamination of water sources by atrazine, which has a much higher solubility in water (33 mg/L water at pH 7 and 22 °C) than either simazine (6.2 mg/L water at pH 7 and 20 °C) or terbuthylazine (8.5 mg/L water at pH 7 and 20 °C). **Atrazine is not registered** for use in South African vineyards.
2. The **use** of all pre-emergence herbicides, including simazine and terbuthylazine, is **restricted** under the **IPW Guidelines** to application on the ridges (planting row) and on the advice of an expert. Under dry land conditions (no irrigation, very little summer rainfall) it is occasionally applied in the work row, but due to the lack of water, leaching is not a factor. It is used only for certain problematic weeds that cannot be controlled by post-emergence herbicides or it is used at very low rates in combination with glyphosate for post-emergence weed control as an **anti-resistance strategy**. When used for post-emergence weed control in conjunction with glyphosate, it binds with the organic material (weeds) and is broken down rapidly, further reducing any risk of run-off and contamination of water sources.
3. Herbicides are applied in vineyards in spring when soil and general temperatures are getting higher. The **high soil temperatures** and exposure to high levels of **UV light** due to the long periods of sunshine combine to effect **rapid breakdown** of the active ingredients (simazine & terbuthylazine). Soil temperatures and UV light levels are considerably higher under South African summer conditions than during summers in Europe.
4. Simazine and terbuthylazine adsorb strongly in soils with a high organic content. In Europe soils tend to have a relatively high organic content, which resulted in higher doses of triazine herbicides being used. South African soils are generally poor in organic content and due to the **low levels of adsorption, lower dose rates** are used (maximum 4-5 L/ha).
5. South Africa is a dry country; the water table is very deep in most places and summer rainfall is low to negligible in the areas where wine grapes are cultivated. Herbicides are applied at the beginning of and during the growing season, which means that there is a very low to negligible risk of run-off. There are also very few open ponds or perennial rivers in vine growing areas – most ponds and rivers are seasonal. Due to the depth of the water table, the low rainfall during summer and the low solubility of simazine and terbuthylazine in water, the **risk** of

**contamination** of water sources due to **run-off and/or leaching** is **very low to negligible**.

6. IPW recommends winter **cover cropping**, mainly for weed control, and the resultant **mulch** further **reduces the risk of run-off** after herbicide applications in spring and summer.
7. Soils in South Africa exhibit a very **high rate of microbial breakdown** of these herbicides.
8. It is important to note that the use of triazine herbicides in South African vineyards and orchards has decreased by approximately 40-50% over the last five years, mainly because of **minimum tillage** and **cover cropping** practices. Many soils are also too alkaline (high pH), resulting in phytotoxicity risks or rapid breakdown of the products. The use of triazine herbicides is also not recommended in soils with less than 10% clay, which further reduces any risk of leaching into water courses.

### **References**

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