

Rinskor[™] active

More sustainable, effective weed control
for better harvests

A product carbon footprint in rice applications

Single-impact life cycle assessment

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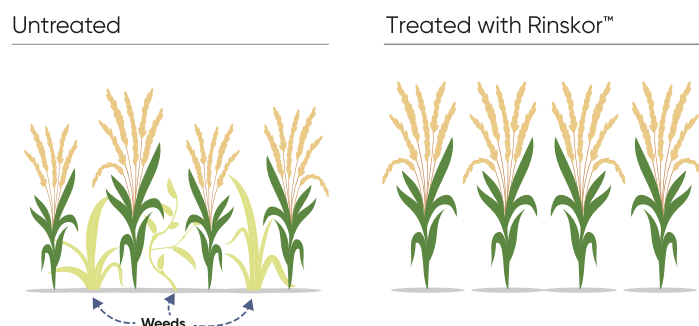
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Introduction

Sustainability is a primary driver in our crop protection product development process

Each product from our pipeline is carefully evaluated for multiple sustainability criteria, and there are high standards for every product. The use of Rinskor™ active to control weeds in rice production demonstrates Corteva's development and delivery of sustainably advantaged products to farmers.



Rinskor active has a reduced environmental impact because it breaks down rapidly in soil, in water, and in the tissue of tolerant plants like rice. With Rinskor, farmers can use up to 150 times less active ingredient to control weeds, compared with many other herbicides such as propanil.

Farmers can apply 10–30 g ai/ha (active ingredient per hectare) of Rinskor to their crops and achieve control over a broad spectrum of yield-robbing weeds. In comparison, farmers need to use 3,300 – 7,200 g ai/ha of Propanil to achieve similar weed control. It has an excellent human health profile and breaks down quickly in the environment, minimizing impact to soil and water, and virtually eliminating concerns about residues. In addition to the many benefits Rinskor offers to farmers, it was of interest to quantify the climate change benefit of Rinskor's low use rate compared to common herbicides in the market using Life Cycle Assessment (LCA) framework.

Rinskor active, a herbicide discovered by Corteva Agriscience, is extremely effective on many broadleaf weeds, grasses and sedges. Rinskor is an aryloxyacetic herbicide, which is part of the synthetic auxins group. Synthetic auxins control weeds by regulating their growth. While some other herbicides are also synthetic auxins, Rinskor works in a distinct way, binding to specific receptors unique from other herbicides. This is why Rinskor is able to control weeds that have demonstrated resistance to other herbicides and is used at much lower use rates. While some herbicides used in rice production must be applied at levels measured in kilograms per hectare, use rates for Rinskor are many times lower, at just grams per hectare.

Background of life cycle assessment study (environmental impacts, data, peer review)

A single-impact LCA has been completed to understand how the product carbon footprint of Rinskor™ compares with propanil, a higher use rate alternative. While these herbicides are used globally for many different crops, this LCA focuses on rice applications in China and the two herbicides are compared on the functionally equivalent basis of one hectare of land.

Various process improvements for Rinskor production were also included in the analysis.

All data for Rinskor were collected internally or via our third-party suppliers. These data range from laboratory-scale results to full-scale production metrics. Use of lab-scale data is a known limitation of this study and Corteva is committed to refining the backend Life Cycle Inventory (LCI) data as appropriate.

Secondary data was used for propanil and raw material production. These data were obtained from Ecoinvent v3.9.1 and DATASMART. The LCA modelling was

completed using SimaPro 9.5.0.1 software.

TrueNorth Collective completed a third-party critical review of the Rinskor active life cycle assessment report in 2024 that follows, but does not comply with, ISO 14044 requirements for supporting comparative assertions. TrueNorth Collective is not responsible for any interpretations, claims, or representations made from this report.



Results

Product carbon footprint comparison

- The results of the LCA study show that a farmer has the potential to save 70–80% of the carbon footprint associated with herbicide application when using Rinskor™ active versus propanil. This was demonstrated with a case study for rice fields in China.
- Based on total area of rice farming in China and the current herbicide market, Rinskor has the opportunity to displace propanil on 780,000 ha in the region. If applied at the same rate annually over the next five years, it could prevent 500,000 metric tons of carbon dioxide emissions from rice farming in this market.

↓ 70–80%

Potential reduction in carbon footprint associated with herbicide application when using Rinskor™ instead of propanil in rice fields in China.



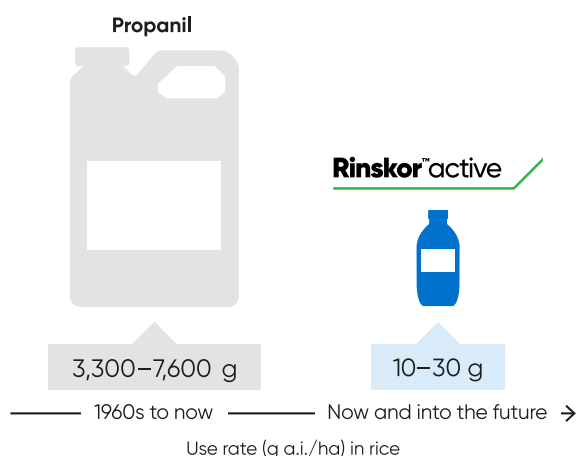
Equivalent to taking over 100,000 cars off the road for one year.



Equivalent to planting 8 million trees for one year.

More convenient weed control

Products containing Rinskor active are very convenient to use on the farm. Because of the low use rates of Rinskor, farmers don't need to handle as much product as with other herbicides.



Economic benefit

Mitigate weed resistance with a differentiated mode of action

Biodiversity benefit

Mitigating weeds, without impacting desirable vegetation

Climate benefit

150x lower use rate potential, resulting in up to 500,000 MTCO₂e emissions savings over five years

Results continued

Production improvements of Rinskor™ active since launch in 2018

- Since the time of product launch in 2018, the product carbon footprint of Rinskor™ active has been reduced through continuous research and development efforts alongside production improvements.
- The LCA study show that these process improvements potentially lead to a 30% reduction in the product carbon footprint of Rinskor, further demonstrating Corteva's commitment to delivering more sustainable solutions to farmers.

↓ 30%

Potential reduction in Rinskor's carbon footprint with process improvements.

Weed control is a constant battle for farmers, made more challenging when key weed species develop resistance to commonly used herbicides. This is especially true in rice cultivation, where certain grasses have become increasingly difficult to control, threatening crop yield and quality.



Conclusion

More sustainable, effective weed control for better harvests

Rinskor™ active is able to treat herbicide-resistant species and reduce herbicide-related carbon emissions while virtually eliminating residue concerns.

Replacing a high-use-rate herbicide like propanil with Rinskor, a low-use-rate alternative, could reduce herbicide-related emissions by 70–80%.

Since first introducing Rinskor to the market, Corteva has been able to reduce the product carbon footprint of Rinskor by up to 30%, demonstrating the value of continuous improvement and exemplifying Corteva's goal to deliver more sustainable and innovative products.



Supporting material

Awards and recognitions



The Green Chemistry Challenge Awards



ICIS Innovation Awards



Agrow Awards



R&D 100 Awards

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About Corteva



Sustainability at Corteva





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