

Agrochemical Detection Using an Agilent Resolve Tactical Handheld Raman Analyzer

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Safe identification of agrochemicals

Agrochemicals are used to improve the amount, quality, and reproducibility of crop yields. This improvement can be done by controlling competition growth with insecticides, herbicides, and pesticides. Over the last century, the side effects of certain agrochemicals have been discovered, and laws have been introduced for protection against the associated health and environmental hazards.^{1,2} The illegal trade of agrochemicals, which includes nonregistered products and counterfeit, adulterated, repackaged, contraband, and stolen goods, is of concern in some agribusiness zones and between some countries. Illegal agrochemicals not only pose a high risk to human and environmental health, but also to crop yield and thus, farmer livelihood.

The **Agilent Resolve tactical handheld Raman analyzer** uses **spatially offset Raman spectroscopy (SORS)** technology to identify hazardous materials, explosives, and narcotics concealed behind single and multiple barriers. These barriers include colored and opaque plastics, glass, paper, cardboard, wrapping, and fabrics. The combination of SORS, high data quality, reduced fluorescence interference, and a library continuously updated with new hazardous substances makes the Resolve tactical handheld Raman analyzer a powerful tool for the detection and identification of controlled substances. As of library 42, there are over 180 agrochemicals that can be identified with the Resolve tactical handheld Raman analyzer, including pesticides, herbicides, and insecticides.

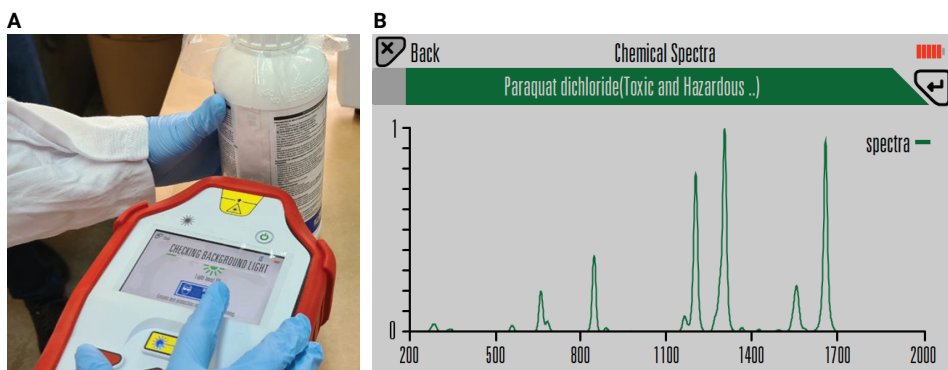
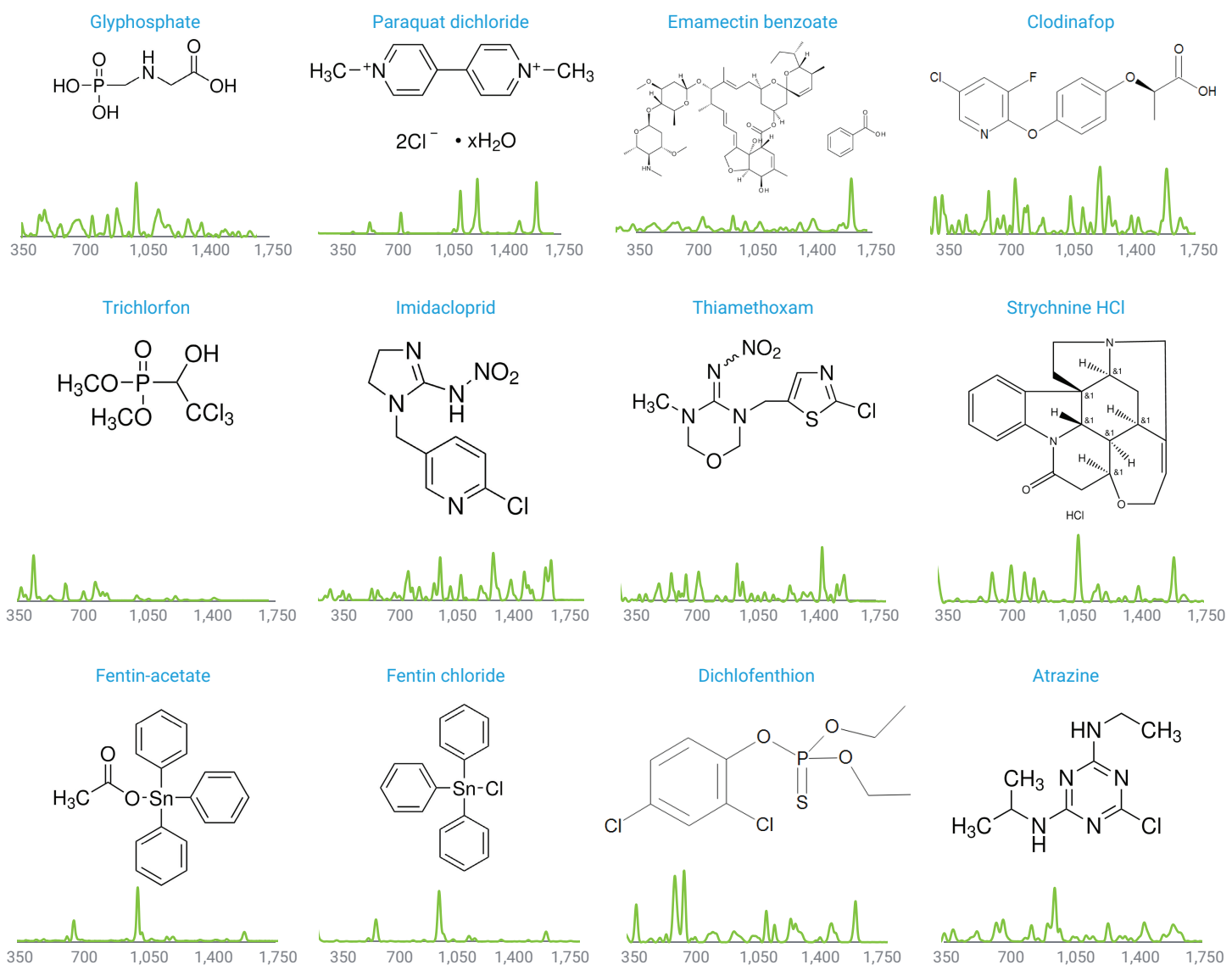


Figure 1. (A) Agilent Resolve tactical handheld Raman analyzer. (B) SORS spectrum of paraquat dichloride in the Toxic and Hazardous Substances spectral library. The use of this herbicide, a type of agrochemical, is banned in many countries.

Structure and Raman spectra of agrochemical materials included in the Resolve library



Fast, direct identification of agrochemicals

The Agilent Resolve tactical handheld Raman analyzer, featuring SORS technology, along with the Toxic and Hazardous spectral library, can be used for the identification of agrochemicals in their original packaging. Direct analysis using the Resolve minimizes the risk of accidental exposure to harmful compounds by law enforcers.

References

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2. Parker, M. A Brief History of Agrochemical Testing. *Charles River eureka blog*. [Online] 2021 May 2021. <https://www.criver.com/eureka/brief-history-agrochemical-testing>.

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