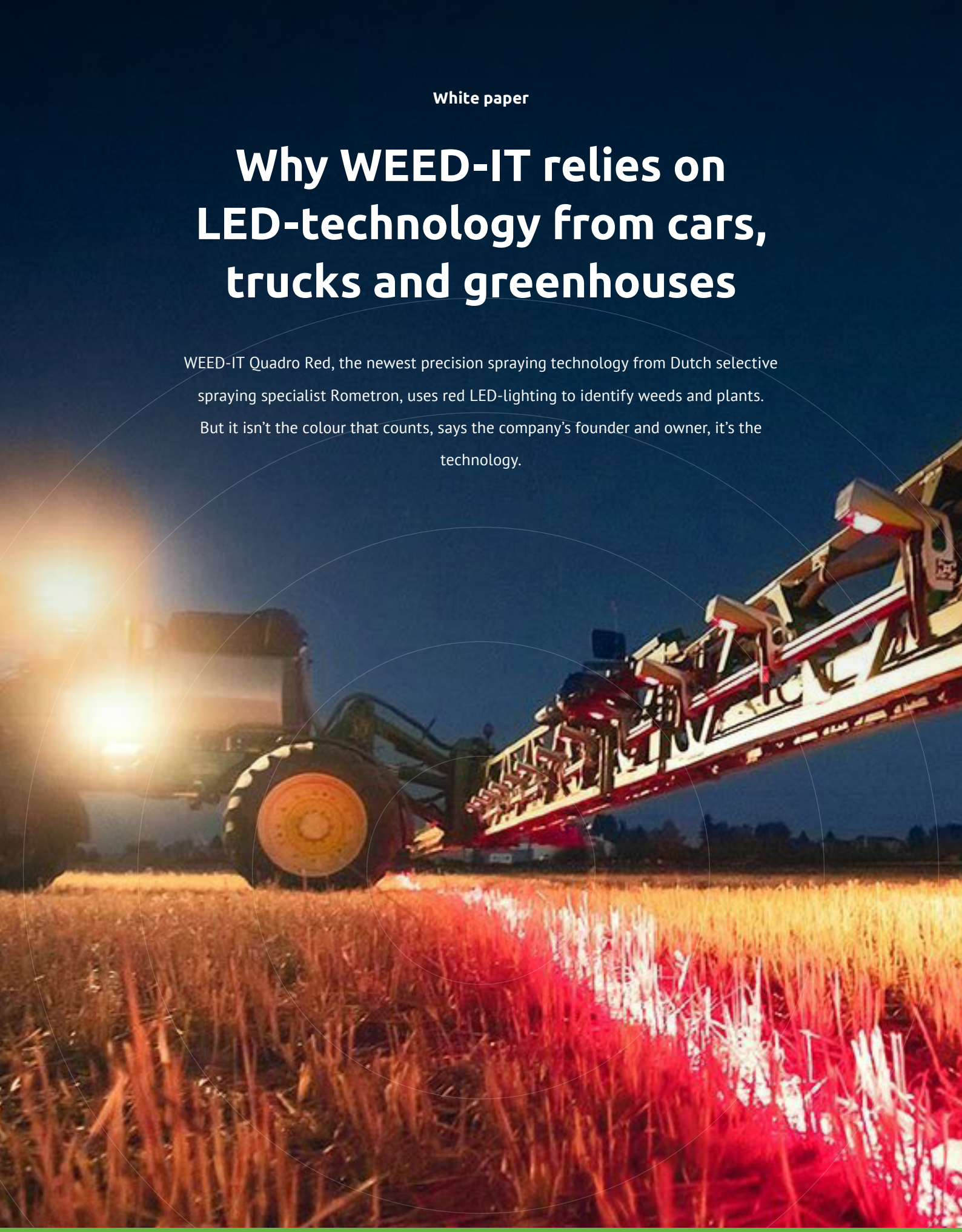
White paper

Why WEED-IT relies on LED-technology from cars, trucks and greenhouses

WEED-IT Quadro Red, the newest precision spraying technology from Dutch selective spraying specialist Rometron, uses red LED-lighting to identify weeds and plants. But it isn't the colour that counts, says the company's founder and owner, it's the technology.



Rometron B.V.
www.rometron.nl

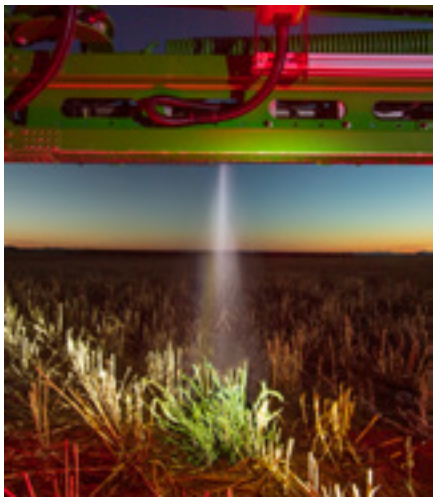
WEED-IT
www.weed-it.com

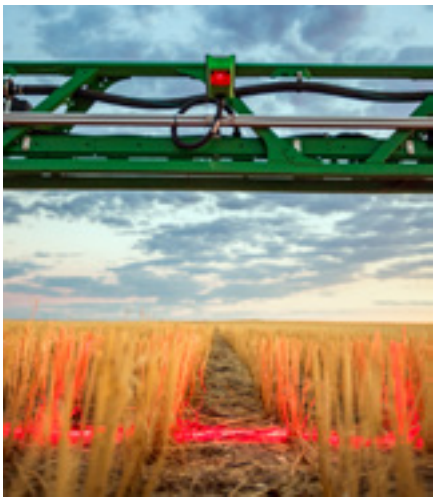
+31 (0)575 45 11 11
info@rometron.nl

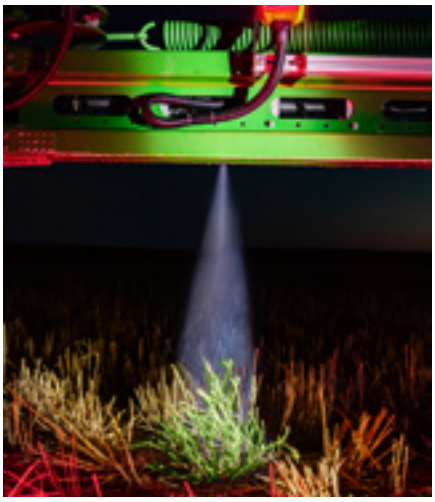
If you spot a broadacre, field, orchard, row crop or even autonomous sprayer out in the fields at night with lights irradiating from the spray boom, you can be sure that you've caught a WEED-IT system helping its owner to eliminate weeds. The lights come from Light-Emitting Diodes, LEDs, that have been programmed to irradiate a particular colour of light. Those LEDs are able to irradiate any type of colour. Something you've surely noticed from modern cars and trucks and even tractors that use LEDs to provide white head lighting and striping, orange indicator lighting and red rear lighting and striping.

Any colour of choice possible

The WEEDit Ag system, predecessor of the WEED-IT Quadro systems, uses red LEDs. The red colour at the time was chosen for a specific reason, says Rometron's founder and owner Roel de Jonge: "Since the initial development in 1997, our technology has been relying on fluorescence technology to detect weeds or rather living plants. With this technology, we illuminate every single centimetre underneath the spray boom with LEDs. As soon as the LEDs 'hit' living plant material, the chlorophyll in those plants responds by emitting a small portion of near infra-red (NIR) light. This is referred to as 'chlorophyll fluorescence'. You could say that each plant briefly becomes a weak little light. The WEED-IT sensors measure the wavelength emitted from the living chlorophyll to distinguish living plants from dead plants, soil and any other substances. We continuously research what LED colour(s) offer the highest reliability, best performance and energy efficiency and the most optimal ease of use for weed elimination on plant level. Initial research together with Dutch Wageningen University and Research (WUR) in the 1990-ies showed that red LED lights were the most energy efficient for use in mobile weed detection technology. It was the most state-of-art technology available and feasible, and fundamental for the success of our first WEED-IT system for agriculture called WEEDit Ag."







Why shift colours?

Roel continues: “LED-technology is getting better and better at an incredibly rapid pace. Just think of the number of LED-lights you might already have in your house, on your car/truck and on your tractors and machinery, including head and work lights. The massive use of LEDs in different sectors across the globe tremendously accelerates their development. At WEED-IT, we always aim to incorporate the best of the best technology and innovations to maintain our competitive advantages and to enable our customers to eliminate more weeds with less effort as sustainable and durable as possible.”

Through the course of time, research by Rometron and Wageningen University and Research proved that incorporating specific LED colours in the WEED-IT system, led to increased reliability, performance and energy efficiency. In 2015, blue LEDs started to outperform all other colours on these aspects and blue therefore became the colour of choice for WEED-IT Quadro systems.

Recent performances in greenhouses show that new red LEDs nowadays outperform all other LED colours including blue on consistency, efficiency and predictability. Since mid-2021, WEED-IT engineers, distributors and customers have been doing extensive comparative testing on the operability and performance of various types of LEDs including blue and red coloured ones. These tests show that red LEDs have become superior to their blue counterparts. Due to these good results, Rometron decided to use red LEDs in its WEED-IT Quadro technology from November 2022 onwards.

While the earmark colour of WEED-IT has evolved from blue to the newest state-of-the art red LEDs, each and every other element of the system remains unchanged. This means that existing users of WEED-IT Quadro can benefit from the excellent service from Rometron and its distributors and from future updates, upgrades and features in the same way and under the same conditions and circumstances as they are used to.

In its never-ending quest for the best of the best, Rometron constantly researches and investigates which innovations are interesting to consider to further optimise and develop its precision spraying technologies. “Not just on weed detection hard- and software, but also on Pulse Width Modulation (PWM) technology. We want to remain the number 1 spot and precision spraying system in the world and use the technologies we see fit best to accommodate our customers and their businesses. And therefore, red LEDs aren’t forever.”

About this white paper

This white paper is offered by Rometron, the Dutch manufacturer of WEED-IT precision spraying technology. The author, Roel de Jonge, graduated on spot spraying from Dutch Wageningen University and Research (WUR) in 1997 and founded Rometron in 1999.