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FIGHTING FUNGICIDE RESISTANCE WITH LAMP

In field early detection
of fungal pathogens

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LOOP MEDIATED ISOTHERMAL AMPLIFICATION (LAMP)

is a tool that is being used to detect fungal pathogens in the field before symptoms are visible. LAMP has been validated as a sensitive and specific method, producing results within the time frame of 40 minutes (previous methods took up to 2 weeks).



The LAMP machine is a small battery operated device that can be easily transported between fields



“We have successfully performed LAMP tests in the field. LAMP can detect traces of targeted fungal DNA down to 15 picograms, this is equivalent to 15 grains in 65000 tonnes of wheat. If it is there, LAMP will find it”

Kejal Dodhia,
CCDM researcher

LAMP technology is still being developed for the detection of additional crop diseases in major broadacre crops. The technology is suitable for use by trained pathologists

How does the process work?

1. A leaf sample is collected and crushed in a special reagent that helps release the plant and disease DNA.



2. The crushed sample is loaded with specific markers into the machine. When heated, the markers attach to the target disease DNA (if present) and makes it glow. The machine detects the glow and reports the results.

3. A complete run concludes in 40 minutes, with the results showing the presence or absence of our target DNA (the fungal pathogen). LAMP has been successful at detecting mutations that are responsible for fungicide resistance.

For the first time in Australia this technology is being used to detect mutations endowing fungicide resistance, with potential to speed up the delivery of key fungicide resistance messages to growers so they can act early

Do you know what disease is pictured?

Is it Septoria nodorum blotch or Tan (yellow) spot?

Seasoned pathologists can find this difficult, however LAMP will tell you.



Photo by DAFWA

In-field application of LAMP in Australia is a collaboration between the CCDM's Fungicide Resistance Group and the Department of Agriculture and Food Western Australia, on a GRDC funded project