UMS comes up with kit for Ganoderma detection

KOTA KINABALU: The Sustainable Palm Oil Research unit (SPOR) from Universiti Malaysia Sabah (UMS) has introduced a comprehensive kit that allow planters to detect a Ganoderma infection in the field.

Ganoderma boninense is a fungus that causes rotting in the basal stem of oil palm and in the field it is known to infect oil palm trees from the roots gradually rotting the tree trunk from bottom up.

It is hard to detect since initial infection does not cause outward symptoms and the only option is to look inside the bottom of the tree trunk.

Early detection is vital in disease management hence a team in SPOR has developed the GanoKit ™ that utilises basic scientific methods, which can be practically applied to the field, namely the Thin Layer Chromatography method.

By combining concepts of plant plathology and what is now known about the infectious cycle of G. boninense, the GanoKit ™ allows a minimally trained person to check the infectious status of a tree.

The name for the kit originated from the fungus of which the kit detects, Ganoderma boninense, and is a registered trademark in Malaysia. It contains everything a planter needs to detect an infection before symptoms appear – solvents, UV lamp, TLC plate, a standard marker for comparison and measuring tubes.

In order to use the kit, the first step is to identify a tree that is suspected to be infected with the fungus and using a drill to take a small sample to obtain potential Ganoderma material inside the trunk.

First drill out the surface of the trunk and remove the trunk bits, clean the drill, and then drill on the same spot to obtain some tree trunk samples. These are ready to be tested using the kit.

The second step involves extracting a cell membrane component of the fungus, called ergosterol, a distinctive feature of fungi and are not found in plant cells.

An infected tree would therefore have ergosterols in the trunk and a healthy tree would not.

The extraction step involves physical and chemical actions that is crushing the samples followed by immersing the samples in the provided solvents.

At this stage, ergosterol is contained in a blend of molecules so there needs to be a technique to separate those molecules.

The third step therefore is to separate the molecules in the mixture. To do this, a drop of the mixture is placed on a special sheet called the TLC plate (Thin Layer Chromatography plate) provided in the kit.

The plate/sheet is placed in a chamber containing a special solvent and during the incubation period, the solvent moves up the plate/sheet via capillary action (just like placing a piece of tissue paper in a glass of water, water travels upwards and wets the tissue).

Unlike the tissue, however, the Thin Layer Chromatography utilises special properties of the solvent and the TLC plate.

The interaction between the two separates the ergosterol from the mixture as the solvent moves up the TLC plate. Once the ergosterol is separated from the mixture, it can then be visualised under a UV lamp provided in the kit.

Detection of ergosterol in trunk tissue has been proved to be associated with detection of G. boninense in several scientific studies.

Ganoderma boninense fruiting body (mushroom – like structure growing on the trunk of a mature palm tree.

Although the GanoKit ™ is only one of the many developed methods to detect an early infection, it is the only method that can be used in the field by minimally trained personnel, that is also cost-effective and does not require a laboratory set up.

These other methods have been discussed in a previous article titled 'Detecting Ganoderma early' published in *Daily Express* on Apr 5, 2015. However, the Ganokit ™ is the only commercial product that provides users an immediate detection without sending samples to a lab.

For a preliminary check, the GanoKit ™ is convenient and easy to use while for confirmatory tests, samples can then be sent to laboratories to be checked using more sensitive methods such as PCR and GSM.

More details on the GanoKit ™ can be obtained at the upcoming workshop organised by the Sustainable Palm Oil Research (SPOR), Universiti Malaysia Sabah (UMS) on Sept 22.

Alternatively, details about the kit can be found on the SPOR website www.ums.edu.my/spor.