Breakthrough in protecting global crops from disease

September 6 2011

A new form of resistance to fungal disease has been discovered in oilseed rape, one of the world's most important crops, which could hold the key to developing disease resistant crops.

Oilseed rape (Brassica napus) is attacked by the Light Leaf Spot fungus (Pyrenopeziza brassicae), which can reduce yields by a third. Until now one of the main forms of protection has come from spraying crops with fungicides. This year a record number of crops were affected by the disease in the UK.

Now a team of scientists from The University of Nottingham, Rothamsted Research and KWS UK Ltd, have used plant breeding methods to discover a new form of built-in resistance to the light leaf spot fungus. They have shown how a so-called "R gene" which produces a protein inside the plant stops the pathogen reproducing asexually during the growing and cropping season, but still allows sexual reproduction at the end of the season. This significantly reduces the

chances of light leaf spot disease becoming established and spreading in growing crops.

Dr. Paul Dyer, an expert in fungal biology at The University of Nottingham and co-author and co-supervisor on the research project, said: “This new resistance gene provides a valuable way to prevent plant pathogens reproducing at a key stage in their life cycle and could lead to a significant reduction of light leaf spot infection in growing crops. This discovery could lead to new strategies for breeding resistance against crop pathogens and increase yields while reducing costs to the farmer and damage to the environment by reducing the use of fungicides.”

The research, published in the journal *Plant Pathology*, was funded by the Biotechnology and Biological Sciences Research Council.

Oilseed rape is one of the world’s most important brassica crops, readily visible by its bright yellow flowers. Grown for the production of vegetable oil, and for use in biodiesel and animal feed, oilseed rape makes a significant contribution to the agricultural economies of Europe, Australia, Canada, China and India.

Whilst there is a major drive to increase global food yields by controlling diseases some fungicides will be banned under new European Union legislation. Those that will still be available are likely to be too expensive to use in developing countries.

Dr. Dyer said: “Our discovery could change the way we look at protecting arable crops from disease. It offers new possibilities for breeders and a way of reducing the use of expensive and potentially damaging fungicides.”

More information: The paper can be accessed at: onlinelibrary.wiley.com/doi/10 … 59.2011.02529.x/full

Provided by University of Nottingham