THE IMPORTANCE OF CROP GROWTH STAGES FOR DETERMINING THE APPLICATION TIMING OF DISEASE CONTROL AGENTS ON RICE

K.M. Chin (1) & A. Bhandhufalck (2)
(1) Ciba-Geigy Agricultural Expt. Station, Beg Berkunci 71309 Rembau, NS, West Malaysia; (2) Ciba-Geigy (Thailand) Ltd., P.O. Box 747, Bangkok 10501, Thailand

ABSTRACT

Effective timing for the application of chemicals in the control of rice diseases requires a clear understanding of the relationships between crop growth stage, disease development and yield. Recent studies on the importance of growth stage as a decision aid in the field management of blast and sheath blight diseases are discussed. Because such studies demand a precise definition of crop growth stage, adoption of a recent modification of the 'Zadoks' decimal code for cereals is proposed.

INTRODUCTION

Blast and sheath blight are major problems of rice in most areas of the world where the crop is grown. High yield losses occur on susceptible cultivars under conditions favourable to disease development. For
example, yield losses attributable to blast range from 43% in the tropics to 90% in temperate areas (1,2) when disease is severe. Sheath blight is also known to cause losses of up to 30-44% when infection extends above the 4th leaf sheath (3,4).

Control of blast and sheath blight is now possible with a number of effective compounds (2,4,5,6). Modern systemic compounds active against *Pyricularia oryzae* include IBP, isoprothiolane, probenazole, tricyclazole, pyroquilon and ferimzone. Unlike the other products, probenazole is reported to have the property of inducing the production of antifungal substances by the host plant.

Strong activity against *Thanatephorus cucumeris* (*Rhizoctonia solani*) has been reported with validamycin, pencycuron, flutolanil, diclomezine and propiconazole. Apart from propiconazole which has a broad spectrum of activity against a range of fungi, the other compounds are specific to the basidiomycetes.

The degree of disease control achieved, yield and economic return from the application of each fungicide is, however, greatly influenced by application timing. Protective fungicides, for example, have to be applied at least one incubation period ahead of the time when disease levels are expected to exceed economic damage thresholds (7).

The exact definition of growth stages of a crop is important for at least three reasons. Firstly, they affect the degree to which disease severity is related to yield, so that damage thresholds vary depending on the growth stage of the crop at which disease is measured. Secondly, when damage is restricted to certain crop stages, monitoring of disease levels and application timings may be carried out at these stages. Finally, precise description of growth stages at which applications are made enable an analysis of product performance at the end of crop growth.