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Quantification of Disease Constraints Associated with Tobacco Production

Diseases impose biological and economic constraints on crop yield and quality accumulation, i.e. crop productivity. In North Carolina and other tobacco producing states in the US losses have stabilized at 3.5-4.0 percent each year. Time series analyses show an inverse relationship between average yield and disease loss trends indicating the magnitude of effect for control practices and management strategies employed over time. Geophyto-pathological mapping (SYMAP) of various crop and loss variables was used to delimit economic risk zones for five major tobacco diseases in North Carolina. Pilot surveys were conducted to estimate variance components of disease distribution and cost functions necessary to design comprehensive surveys and expand loss estimates to large geographic production areas. Shifts in cultivar preference were studied in relation to spatial and temporal deployment of vertical and horizontal resistance and the use patterns of various chemical controls. The relevance of sound assessment data to short term and long range decisions on breeding for resistance, control tactics, and disease management strategies will be discussed.

PRABHU, A.S., J. C. D. FARIA and ZIMMERMANN, F. J. P. (Centro Nacional de Arroz e Feijão, GOIÂNIA, GOIÁS, BRAZIL)

An Experimental Approach To Estimate Yield Loss Due To Rice Blast

A method for estimating yield loss due to leaf and panicle blast of rice under upland conditions in Brazil has been suggested. Linear relationships between leaf blast severities at different growth stages and yield have been established. The leaf blast severities at the reproductive phase of the crop growth and the panicle blast severity 25 days after heading accounted for the grain yield differences. A stepwise multiple regression procedure was used to develop combined equations for five early and nine late maturing rice cultivars. The leaf blast and panicle blast severities together explained 92 per cent of the variation in yield.

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A tentative model to predict yield losses in wheat caused by *Septoria nodorum* glume blotch for a directed control of the disease.

The major factors accounting for the yield losses caused by *Septoria nodorum* glume blotch are the *Septoria* inoculum density at the heading stage and the humidity conditions henceforth. The *Septoria* incidence on senescent to nearly dead leaves at the end of heading appears to be the main inoculum for ear infections, at least it is highly correlated with it. Since in 1975 and 1977 weather conditions beginning at heading were nearly optimal for *Septoria* infections and symptom development, the influence of only the inoculum density could be analysed.

In the spring wheat cv. Kolibri an exponential relationship could be established between the *Septoria* leaf disease severity rating ($= x$) and the 1000-grain weight ($= y$). This association was confirmed investigating 12 winter and spring wheat cvs. at one location in 1977. From the regression function $\hat{y} = 93,32 - 4,89 \cdot \log x$ a tentative negative prognosis is derived: In southern Upper Bavaria significant economic losses caused by *Septoria* glume blotch will not occur, when at heading leaf disease severity ratings ranging from 0,1 to 1% are not reached.