

Relationship between meteorological factors and incidences of rusts of peanut and soybean at Hualien¹

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summary

Rust diseases usually cause serious damage on peanut and soybean at apring and fall crops at Hualien area. For realizing the relations between meteorological factors and incidences of rust in the field, experiments were conducted from fall 1988 to spring 1991 at Hualien. Three peanut cultivars Tainan selection 9, Tainan 10 and Tainan 11 were used as well as three soybean lines SRE-D-11-A (tolerant line), AGS 217 (moderately tolerant line) and Hualien 2 (susceptible line). Peanut and soybean were sowed monthly on the 15th of each month. The meteorological data including air temperature, relative humidity, precipitation, dew period, wind speed and solar radiation were collected and analyzed. The rust incidences of peanut and soybean were also surveyed weekly during growing periods. The agronomic characters of peanut and soybean including days to flowering and maturity, yield and shelling percentage were recorded during the growing stages or after harvest. The high infection of peanut rust was surveyed during the fall crops in Oct.-Nov. 1988 and Sep. Nov. 1989. Soybean rust occurred more trequently and severely than peanut rust, and with high infection in Oct. -Nov.1988, May-June, Oct.-Nov.1989 and May-June 1990. The plant height, yield and/or shelling percentage were reduced by the rust, and its days to maturity were shortened. Among the meteorological factors, relative humidity and precipitation correlated positively with the incidences of rusts of peanut and soybean. The high relative humidity (>90%) which maintaining for 7 hours or longer will promise the infection of rust. The high and long relative humidity periods occurred at intervals of 10 days will promote heavy rust. The rainfall is found to be the dominant factor to induce high relative humidity, so its length is more significant than its volume to rust. The optimal air temperature is 18 26 for rust development in the field. The podding stage of peanut as well as flowering stage of soybean is the initial infection period for rust, whereas the seed-filling stage is the epidemic period for both tested crops. Peanut and soybean are suggested to be sowed in April-June to escape the rusts at Hualien area.

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