

Scientific Notes

Yield Losses of Sweet Corn Cultivar Honey 236 Caused by Southern Rust

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Southern corn rust caused by *Puccinia polysora* Underw were reported in 1976 in Taiwan (1). Since then, it spread widely and became very important on corn, particularly threatened to sweet corn cultivation. The biology and resistant breeding of corn rusts have been studied (4,5). However, the yield reduction caused by the rust has not been reported in Taiwan. According to Rodriguez-Adron et al (3), yield loss caused by southern rust was as much as 45% in the susceptible hybrids.

The experiments were conducted at the experimental farm of Taiwan Agricultural Research Institute. Planting dates of sweet corn cultivar Honey 236 were 26 September, 1989 (fall crop), 5 February, 1990 (spring crop), 20 September, 1990 (fall crop), 8 February, 1991 (spring crop) and 4 September, 1991 (fall crop). Each experiment included six replicates of two treatments arranged in a randomized complete block design. The treatments were: a) unsprayed plots and, b) plots sprayed with Sapol 18.6% EC 750 X started at 3-to 4-leaf stage at the interval of 10 days to protect the plants from infection by the rust. Experimental units consisted of plots about 8 m long and 4 m wide. Plant populations were about 50,000 per hectare or 25 cm between plants and 80 cm between rows.

Rating of rust severity was taken on all leaves of the plant by Peterson's scale (2). Thirty representative plants from each plot were randomly selected for disease evaluation before harvested. When the water content of grain was about 72%, the ears of selected plants were harvested and weighed.

The results showed that the lowest relative disease severity was 7.25% in 1989 fall crop, and the highest was 25.68% in 1991 spring crop without chemical control (Table 1). The relative disease severity of all the plots with chemical control was under 1.0%, therefore, the yield reduction needed not to be considered. The yields of different crop seasons were different significantly in 1990 and 1991, but not different significantly in 1989 (Table 2). The relationship between disease severity and yield reduction was plotted in Fig. 1. Percent yield reduction $Y = -2.09 + 0.77 X$ ($r = 0.98$, $P < 0.01$), where X is disease severity.

Key words: yield loss, sweet corn, *Puccinia polysora*.

TABLE 1. Relative disease severity of southern rust on cultivar Honey 236 at different crop season

Year/crop	Disease initiation	Relative disease ¹ severity (%)
1989 Fall crop	8-to 10-leaf stage	7.25
1990 Spring crop	5-to 6-leaf stage	18.68
Fall crop	8-to 10-leaf stage	15.10
1991 Spring crop	7-to 8-leaf stage	25.68
Fall crop	8-to 10-leaf stage	15.56

1. Relative disease severity was measured as percentage of the leaf area infected by rust disease (2). Mean of six replicates.

TABLE 2. Mean yield (kg/ha) of sweet corn cultivar Honey 236 at different crop season¹

Treatment	1989		1990		1991	
	Fall crop		Spring crop	Fall crop	Spring crop	Fall crop
With chemical control	6583 a ²		6310 a	6462 a	6738 a	5986 a
Without chemical control	6301 a		5603 b	5837 b	5477 b	5438 b

1. Mean of six replicates.

2. Values in the same column followed by the same letter are not different significantly at 5% level (F test).

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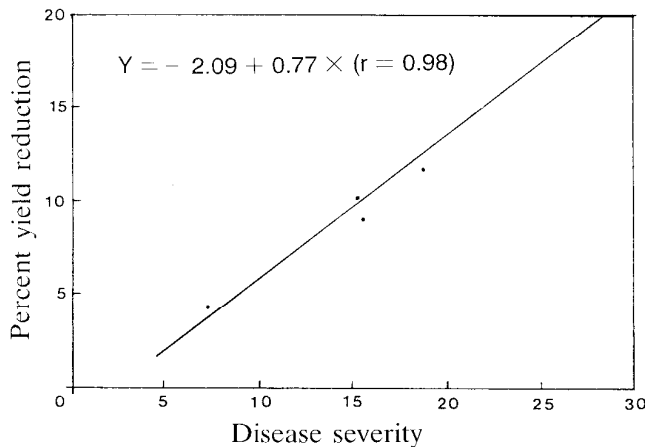


Fig. 1. Relationship between disease severity of corn southern rust and yield reduction. Points represent six-replicate means of cultivar Honey 236 in each crop season.

摘 要

蔡武雄、蔡志濃。1992. 甜玉米品種哈蜜 236 感染南方型銹病引起之產量損失。植病會刊 1:43-44. (台中縣霧峰鄉 臺灣省農業試驗所)

民國七十八年秋作，七十九及八十年春、秋作共五期於本所試驗田進行試驗。種植甜玉米哈蜜 236，分為施藥(殺普 18.6%乳劑 750 倍)保護區與未施藥區，比較其產量。除了七十八年秋作，被害度僅 7.25%，施藥區與未施藥區產量差異不顯著外，其餘期作產量差異顯著。經迴歸分析得 $Y = -2.09 + 0.77 X$ ($r = 0.98$, $P < 0.01$)，Y 為減產百分比，X 為被害度。

關鍵字：產量損失、甜玉米、南方型銹病菌。