

HOJA BLANCA OF RICE AND THE HISTORY OF THE DISEASE IN COLOMBIA¹C. Garcés-Orejuela, Peter R. Jennings, and R. L. Skiles²

The discovery of hoja blanca of rice in Cuba, Venezuela, Panama, Costa Rica, and Florida (2) in the years of 1954-57 has caused considerable concern in all of the rice-growing regions of the Western Hemisphere. According to available information, hoja blanca was a new disease and very little was known about it except that it spread rapidly when it entered a new area, and, furthermore, severely reduced yields by causing stunting and panicle sterility. The transmission of a pathogenic agent by one or more species of leafhoppers, demonstrated in 1957 (8), indicated the probable virus nature of the disease. Various sources of resistance, mainly in the short grain "Japanese types", were found in the world rice collection of the United States Department of Agriculture in Cuba and Venezuela (2).

In December of 1957 it came to the attention of Colombian agronomists that symptoms very suspiciously like those of hoja blanca could be seen in experimental and commercial rice in the Cauca Valley of Colombia. This valley has been one of the country's principal rice-producing regions for many years. The experimental material comprised 2200 lines of the world rice collection obtained from the United States Department of Agriculture and planted at the Palmira Agricultural Experiment Station in the center of the Cauca Valley. All of these lines had been planted in Cuba and Venezuela and their reactions to hoja blanca were reported by Atkins and Adair (2).

In January of 1958 Dr. C. Roy Adair, of the United States Department of Agriculture, who had had occasion to study the disease in Cuba and Florida, toured the principal rice areas of the Cauca Valley and Tolima in company with the authors and other Colombian plant pathologists and rice breeders, and confirmed the existence of hoja blanca in Colombia. It was found widespread in both rice areas, and the syndrome was typical of the disease as it has been described previously (1, 7, 8).

A high degree of prevalence and severity of hoja blanca was found in the world collection at the Palmira Experiment Station. Disease ratings of nearly all individual lines corresponded to those recorded for the same material in Cuba and Venezuela (2). In the Cauca Valley several commercial fields of Bluebonnet 50, Zenith, and Early Prolific and some local varieties developed by selection from older commercial varieties showed varying degrees of severity. Diseased plants were found in all fields. In one relatively large planting hoja blanca was so widespread and severe that the owner planned to plow under the crop. In other fields, however, the disease was limited to a few scattered plants. Younger rice of 50 to 70 days consistently showed much more disease than rice that was nearing maturity. These observations indicated that date of planting, as has been noted in Cuba, may influence the amount of disease.

In Tolima, hoja blanca was readily found in Bluebonnet 50 and Rexoro, the principal varieties of the region. Again there was a wide range of prevalence and severity, with 20 to 30 percent of the plants showing symptoms in some fields. No hoja blanca was observed in two fields of Century Patna which was nearly ripe. Red rice was highly susceptible. As in the Cauca Valley, the incidence of the disease was found to be highest in late-seeded rice.

At the time of Dr. Adair's visit to Colombia the senior author called attention to the fact that he had seen and described what was evidently the same disease in Colombia as early as 1935. Even at that time he had referred to the disease as "chlorosis or hoja blanca." In 1940 and 1941 the senior author wrote (5, 6): "(Hoja blanca) is found in most of the rice zones of the country, causing losses of greater or lesser degree according to the intensity and the time when it occurs. The first references to this disease indicate that it first appeared in the Cauca Valley. . . in the year 1935-36. Since then it has appeared in Tolima, Huila, Magdalena . . . and Santander Norte. The farmers differ considerably in their opinions of the importance of the disease." Bernal-Correa, who at one time was the plant pathologist at the Palmira Experiment Station, wrote in 1939 (3): "(Hoja blanca), according to the farmers, first appeared three years ago. It is found uniformly distributed (over the Cauca Valley), but its intensity is not as great as *Helminthosporium*." And in 1940, he stated (4): "The name hoja blanca that has been given to this disease is due to the color of the infected plants. A plantation affected by this disease can be distinguished at a distance by the typical color of the leaves which. . . have a lemon-yel-

¹Paper No. 98 of the Agricultural Journal Series of The Rockefeller Foundation.

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low hue. Some chlorotic plants recover and others die; some leaves . . . show yellow, parallel stripes along the veins. (If mature plants) do not die, they do not produce seed. The chlorosis is usually not found in the entire plant but rather in some of the tillers. (It can be noted) that while some tillers of a single plant are entirely healthy, others are completely infected." In the same report, Bernal-Correa also noted the susceptibility of such varieties as Fortuna, Rexoro, Lady Wright, Early Prolific, Guayaquil, Santa Maria, and others. One variety, "Precoz 6", was highly resistant and yielded well.

According to observations of the senior author and Señor Gabriel Lopez, who worked at the Palmira Experiment Station as a rice breeder from 1942 to 1953, the prevalence and severity of hoja blanca has varied considerably from year to year in the Cauca Valley. In some years the disease was not observed, while in others it caused some concern to the rice farmers. It would be impossible to obtain even rough estimates of rice yield reductions in former years due to hoja blanca in the Cauca Valley or elsewhere in Colombia. The pathologists at the Palmira Experiment Station have changed several times in the intervening years since the senior author was stationed there, and the records have not been maintained continuously. Furthermore, any information obtained from the farmers themselves would be mostly hearsay.

From the information presented here it seems probable that hoja blanca of rice is not a new disease in the Western Hemisphere, as formerly believed, but rather one that has been known for at least 23 years in Colombia. It was severe enough in certain fields in Colombia in the early part of 1958 to destroy the crop completely. On a few occasions in former years it has caused sufficient damage in rice plantations to be quite noticeable, but no information was obtained with respect to loss estimates. In other years hoja blanca was not seen, an indication that the disease is similar to other plant diseases in general in regard to its cyclic development and is not one that causes tremendous losses every year.

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