COMPREHENSIVE RESEARCH ON RICE

ANNUAL REPORT

January 1, 1979 - December 31, 1979

PROJECT TITLE: Weed Control in Rice.

PROJECT LEADER AND PRINCIPAL U.C. INVESTIGATORS:

PROJECT LEADER: D. E. Bayer, Botany Department.

PRINCIPAL U.C. INVESTIGATORS: Ernie Roncoroni, Staff Research Associate, Jack Williams, Carl Wick, Steve Scardaci, Farm Advisors, and Marlin Brandon, Cooperative Extension Agronomist.

LEVEL OF 1979 FUNDING: $19,012.

OBJECTIVES AND EXPERIMENTS CONDUCTED BY LOCATION TO ACCOMPLISH OBJECTIVES:

Objective 1. To develop safe effective and economical weed control measures for rice production in California.

a. Evaluate new herbicides, U.C. Davis.

b. Develop detailed procedures for the use of herbicides showing promise for controlling weeds under California rice growing conditions. Butte County, Colusa County, Sutter, County, U.C. Davis.

c. Determine fate of these herbicides in the rice cultural environment. Butte County, Sutter County, U.C. Davis.

d. Reporting of information to rice growers and other rice research workers.

Objective 2. Determine the time and extent of damage and yield loss caused by various infestations of weeds.

a. Weed competition experiments, U.C. Davis.

b. Laboratory and greenhouse studies on the biology of certain rice weeds, U.C. Davis.

SUMMARY OF 1979 RESEARCH (MAJOR ACCOMPLISHMENTS) BY OBJECTIVES:

Objective 1.

Five new formulations of molinate (Ordram$^{(R)}$) were evaluated at U.C. Davis to determine if longer barnyardgrass control could be obtained.

Applications of the new formulations along with the standard 10 G and 8 EC formulation were made preflood incorporated and 17 days after flooding (second leaf stage of growth of barnyardgrass).

One new granular formulation did increase barnyardgrass control. The combination of R-33865 and molinate 8 EC showed promise this season for extending the effective period of barnyardgrass control.

Combinations of molinate (Ordram) with other herbicides registered for use in rice was again evaluated. Molinate applied 17 days after flooding followed by bifenox (Modown) or butachlor (Machete) extended the period of satisfactory barnyardgrass control. Applications of oxidiazon (Ronstar) caused severe phytotoxicity to the rice.

A timing study to evaluate several herbicides for the control of smallflowered unbrellaplant was established at the U.C. Davis rice facility. The first applications were made 22 days after flooding when the smallflowered unbrellaplant was 2 inches tall or less. The flood water was first removed to expose the small seedlings and reflooding was delayed for 36 hours.

The second application was made 35 days after flooding when the majority of smallflowered umbrellaplant was 6 inches tall. The flood water was lowered to 1/2 inch in depth to expose as much leaf surface as possible.

The third application was made 52 days after flooding when 10% of the smallflowered umbrellaplant had flowered and the last treatments were made 72 days after flooding when the smallflowered umbrellaplants were in full flower.

Applications of bentazon (Basagran) with and without the addition of nonphytotoxic oil did control smallflowered umbrellaplant at the 22 and 35 days after flooding application dates. The addition of the nonphytotoxic oil did increase control at 52 days after flooding treatment although complete control was not obtained. At the 72 days after flooding application bentazon plus nonphytotoxic oil did produce some leaf burn of the smallflowered umbrellaplant but little or no control was obtained. None of the applications of bentazon alone or in combination with nonphytotoxic oil were phytotoxic to the rice.

The early applications of MCPA alone and in combination with X-77(R) did control smallflowered umbrellaplant without affecting the rice yield. Although all applications of MCPA did cause early injury to the rice the 1 lb/A rate plus nonphytotoxic oil was the most severe causing stunting of the rice plant and a decrease in rice yield.

The 52 and 72 days after flooding applications of MCPA also cause leaf burn on the smallflowered umbrellaplant but did not kill the plant.

Two other herbicides, bromoxynil and AXF 1095, provided excellent control of the smallflowered umbrellaplant at 22 days after flooding date, but control decreased at the later treatments. No rice phytotoxicity was noted from any applications of these herbicides.

Du-ter, the rice stem rot fungicide, was evaluated for the control of southern naiad in Colusa County. Applications of Du-ter controled southern naiad early but regrowth occurred because of the short residual life of the Du-ter.

Grower applied molinate (Ordram) as a water-run application was evaluated in Butte County and Sutter County. As with other types of molinate applications, water management was very important for barnyardgrass control. Where the water depth was maintained good barnyardgrass control was obtained but where water was lost or soil exposed no control was observed.

Water and soil samples were collected during and for several weeks following the molinate water-run applications. These samples will be analyzed in our laboratory, at U.C. Davis, to determine the distribution and dissipation of molinate from the rice growing environment.

In cooperation with N. Akesson, Department of Agricultural Engineering, MCPA drift from an airplane application onto young almond and female Pistachio trees was evaluated. Trees planted in 5 gallon containers were set out at stations up to 800 meters downwind from the treatment area.

After the proper wind speed and direction were established the application was made. Leaf samples from 6 trees at each sampling station were then collected for MCPA residue analysis and the remaining 6 trees from each station were returned to U.C. Davis for observation. MCPA symptoms were recorded and trees will be observed in the spring when regrowth occurs. MCPA symptoms were noted on the Pistachio trees at 200 meters from the application and on almonds at 100 meters. In decreasing order of sensitivity to MCPA was Nonpareil — Mission — Neplus.

Objective 2.

The growth habits of smallflowered umbrellaplant were again studied in the greenhouse and laboratory.

Once the smallflowered umbrellaplant develops to a certain stage of growth it is then capable of regenerating new growth following an application of MCPA. This new growth is rapid because the plant was well established before the herbicide treatment.

PUBLICATIONS OR REPORTS:

Bayer, D. E. 1979.
University Extension Class, U.C. Davis

Bayer, D. E. 1979. Weed Control in Rice.
Farm Advisor Meetings.

Bayer, D. E. and E. J. Roncoroni. 1979. Preliminary Rice Weed Control Report. Annual Report.

CONCISE GENERAL SUMMARY OF CURRENT YEAR'S RESULTS:

To obtain the maximum control of smallflowered umbrellaplant MCPA must be applied prior to the formation of the small buds at the base of the main stem. Once these buds have developed the control decreases rapidly. This may mean the water level be lowered to expose a maximum of the weed foliage.

Bentazon (Basagran) has provided optimum control when applied to small-flowered umbrellaplant during the seedling stages if good coverage of the plants can be obtained. This requires draining of the fields to expose the plants. The addition of nonphytotoxic oil frequently enhances the activity of bentazon especially under adverse environmental conditions or when the plants are older and better developed.

Water management is critical when molinate (Ordram) is applied in a water-run treatment. For optimum results the fields should be level and flooded rapidly. Once the molinate has been applied the water-level should be maintained. Draining of the field or lo-s of water for any reason will decrease barnyardgrass control.