Field Tests of Pesticides Against Paddy Borer and Sheath Blight on the Second Rice Crop in Taiwan from 1959—1960

By

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INTRODUCTION

The sheath blight *Corticium Sasakii* has been a serious pest of rice for approximately 5 years. It is more serious in Chia-nan districts than anywhere on the island. The second rice crop suffers more heavy damage than the first rice crop, and paddy borer *Schoenobius incertulas* infestation appears simultaneouly. The sheath blight infestation on the Pon-lai variety is more susceptible than the native variety of rice. In recent years, the Pon-lai variety of rice has been extensively cultivated for superseding the native variety of rice on the second rice crop in Chia-nan districts. Since parathion (folidol or ekatox) and endrin had been promising for paddy borer control, so that the disease is widespread and causes large damage to rice under prevailing climatic conditions. In Chia-nan districts, it has been credited with reducing the value of the second crop up 10% to 20% at harvest. In the experiments, the treatments of insecticides-fungicides mixtures were tested as compared with insecticidal treatments against the paddy borer and the sheath blight, separately. This results of the experiments obtained are presented in this paper.

METHODS AND MATERIALS

The field tests were carried out at Shang-tzu-ting, Chia-yi Agricultural Experiment Station, Taiwan in 1959-'60. Plots were 25 sq. m. in size, and the design in each experiment was a completely randomized plot arrangement containing four replications with nine treatments and three untreated plots. Each plot had 20 rows making 20 hills per row in which there were 400 hills per plot. The plants were spaced 25 cm by 25 cm apart. The variety of rice was Chia-nung No. 242 which was transplanted on July 24 in 1959 and transplanted on July in 1960. The treatments consisted of 46.7% folidol (Bayer), 46.7% folidol(Wufung), 50% ekatox (Sandoz), 100% tuzet WP and 82% thiotox WP in 1959 and consisted of 46.7% folidol (Bayer) 19.5% endrin (Shell), 50% ekatox, and 100% tuzet WP in 1960. All treatments were applied in water emulsion with a samll type of automatic sprayer on Aug. 17 Sept. 19 at 9-22 days of intervals in 1959 and applied with same equipment on Aug. 26 and Sept. 20 at 24 days intervals in 1960. The rate of application early in the season was

800 liters of dilution per hectare and followed to give an increase of 1,200 liters of dilution sprayed per hectare for the last two treatenmts in 1959 experiment Two applications were made with 1,200 liters of solution per hectare, respectively. Those sprays were used with the active ingredionts at 1.25 kg of each insecticide and 1.6 kg of each fungicide per hectare in 1959 expcriment and used with the active ingredient at 0.96 kg of each insecticide and 0.80 to 0.91 kg of tuzet per hectare in 1960 experiment. The panicles of paddy borer infestation were recorded by examining 300 and 200 hill randomly selected

Table 1.- Control of paddy borer & sheath blight on the second rice crop with certain pesticides in 1959-'60

Emulsion & Wettable Powder used	Damage: Empty panicle Percent	Empty panicle Angle	Stems invaded by fungi Percent	Stems invaded by fungi Angle	Yield of rice kg./ha.	Index
Experiment in 1959 (Applications on Aug. 17, Sept. 9 & 19)						
0.04% Folidol (Bayer)	1.3	6.4	14.7	22.5	4,608.0	118.7
0.04% Folidol+0.05% Tuzet	2.9	6.8	3.3	10.5	4,980.0	126.2
0.04% Folidol−0.05% Thiotox	3.0	9.9	5.8	13.9	4,880.0	125.8
0.04% Folidol (Wu-fung)	4.8	12.3	16.9	24.2	4,496.0	115.0
0.04% Folidol+0.05% Tuzet	2.5	6.6	2.1	8.2	4,948.0	127.0
0.04% Folidol+0.05% Thiotox	3.3	6.4	7.7	16.0	4,756.0	122.6
0.04% Exatox (Sandoz)	1.7	7.4	13.4	21.3	4,640.0	119.6
0.04% Ekatox+0.05% Tuzet	2.1	4.7	4.3	11.8	5,020.0	129.4
0.04% Ekatox+0.05% Thiotox	3.2	10.6	11.7	19.8	4,744.0	122.3
Check (untreated)	11.6	19.8	16.7	24.0	3,879.0	100.0
L. S. D at 5% level		6.8		7.5	645.6	
1% level		12.9		10.6	911.0	
Experiment in 1960 (Applications on Aug. 26 & Sept. 20)						
0.04% Folidol	1.7	7.5	25.9	27.2	4,368.0	110.5
0.04% Folidol+0.05% Tuzet	1.9	7.8	1.1	6.0	4,712.0	119.0
0.04% Folidol+0.033% Tuzet	2.1	8.2	1.0	5.5	4,460.0	112.9
0.04% Endrin	1.0	5.3	28.1	30.1	4,580.0	115.9

0.04% Endrin+0.05% Tuzet	0.9	5.3	0.8	5.1	4,976.0	125.9
0.04% Endrin+0.033% Tuzet	1.3	6.5	2.7	10.9	5,248.0	132.8
0.04% Ekatox	1.4	6.2	22.0	25.6	4,352.0	112.7
0.04% Ekatox+0.05% Tuzet	1.7	7.2	1.3	6.9	4,832.0	122.3
0.04% Ekatox+0.033% Tuzet	1.4	6.7	3.7	10.9	4,744.0	120.0
Check (untreated)	4.8	12.5	21.7	24.5	3,9252.0	100.0
L.S.D at 5% level		4.0		21.4	882.4	
1% level		5.7		30.3	1245.2	

in each plot on Oct. 5, 1959 and Oct. 20, 1960. The rice stems of sheath blight infestation were determined by examining all 200 hills randomly selected in each one on Oct. 31, 1959 and Oct. 20, 1960. Plot data obtained from post-application survey were prepared for statistical treatment by determining the infestation reduction as percentage. The percentage, many of which were nearly equal to 100, were then transformed to angle for analysis of variance.

RESULTS AND DISCUSSION

Each treatment reduced the paddy borer infestation significantly below that of the untreated plot and significantly more rice was produced on the treated plots, there were no significant differences between the treatments. The rice stems of sheath blight infestation in various treatments gave a significant reduction lower than in the check and insecticidal treatments and were not significantly different between the different fungicidal treated plots combined with insecticide and insecticidal treatments. All plots receiving insecticides-fungicides mixtures produced an increase in yield over that producde by varieous insecticidal treatments, there were no significant increase in yield over between the insecticides-fungicides mixtures and the insecticidal treatments, but tuzet combined with inseticide spray produced a little increase in yield over that produced by thiotox combined with insecticide spray. Higher dosage of tuzet combined with insecticide spray was better than low ones, there were not significantly increase in yield over among the different dosage sprays, as shown table 1

SUMMARY

In the experiments, each insecticide spray applied at a rate of 0.96 or 1.25 kg per hectare, but endrin and ekatox sprays gave better than folidol sprays,

local formulation folidol and formulation folidol from abroad were equally effective in controlling the paddy borer. Each fungicide combined with insecticide spray applied at a rate of 0.80 to 0.91 or 1.6 kg per hectare were nearly equal in effectiveness against this disease. But tuzet gave better than thiotox. 0.03% tuzet spray produced not significantly increase in yield over that produced by 0.05% tuzet spray and may be promising for sheath blight control. Excellent control of paddy borer and sheath blight was obtained with 0.04% of insecticide combined with 0.03% tuzet or 0.05% thiotox sprays in all the experiments.

中文摘要

民國44—59年臺灣田間綜合藥劑防治二期作三化螟及紋枯病試驗報告

陶家驊 湯慶銓 余健敏

嘉義農業試驗分所

三化螟及紋枯病爲二期作主要病蟲害，其發生和爲害時期，概爲大同小異，因此，殺蟲劑及殺菌劑混合後舉行防治，頗爲理想，藉以減低防治勞資成本，本試驗參加之殺蟲劑4種，卽本省加工之46.7%富粒多（Folidol），國外加工46.7%富粒多，50%益加斯（Ekatox）及19.5%安特靈(Endrin)等乳劑；殺菌劑兩種，卽100%多穗(Tuzet)及82% Thiotox 可濕性粉劑等，每公頃施用殺蟲劑有效成份，0.96—1.5kg，其防治成果，大致相等，其中以安特靈及益加斯稍較富粒多爲優，但本省加工富粒多和泊來品者，均無顯著差異。殺菌劑每公頃施用有效成份0.80,0.91及1.6kg防治紋枯病效能，均無顯著差異，其中以多穗稍較Thiotox爲優，惟多穗高濃度處理者，對於稻穀產量似無顯著差異，0.04%殺蟲劑及0.033%多穗或0.05%Thiotox 防治三化螟及紋枯病，均獲有效成果。