

Studies on the Effect of Triacontanol on the Growth and Yield of Rice Plants

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트리아콘타놀이 벼의 성장과 수량에 미치는 영향에 관한 연구

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ABSTRACT

For the purpose of rice yield, 3 rice varieties S-235(Sam-Pung), S-287(Tai-Baik), S-294(Nam-Pung), control experiment College of Agriculture, Seoul National University garden in 1982. Method of experiment are 4 treatment, 4 replication and randomized block design. Unhilled rice were increased S-235 of 14.8%, S-287 of 16.2%, S-294 of 15.7%. Each varieties were each significant of 1%. And the best increased, Triacon 10 and CaCl_2 15 mM. It think that problems were the more study.

Among factor of yield, increase is panicle no. of hill and the same varieties. Only S-287 of panicle of hill is significant of 5% and also 1000 seed weight is not significant. The factor of increase yield is important of no. of flower. No. of flower increase is concerned Triacon, the mechanism will study.

INTRODUCTION

Triacontanol(Triacon) was discovered by Ries (1977) and synthesized by Welebir of Biochemical Research Co-operation(U.S.A) in 1981. Triacon was used successfully by the author in the culture of various crops. This chemicals to be sprayed at initial growth stage(3~4 leaves) is very cheap in price 3~5 cents per 1 acre and brings about an epochal increase in the yield of crops. According to Welebir(1982), it showed an increased yield of 90% in bean, 62% in radish and 70% in watermelon. He further reported that the yield of rice plans and protein of grains showed an increase more than 10%, respectively one week after planting.

Bhalla(1981) reported that Triacon treatment increased the growth of corn and tomatoes in the

green-house, although the results of 46 field experiments with Triacon applications in several parts of the world generally showed no significant increase in crop yield, except for one test in Japan, where the yield of rice was increased 17 to 21% by soil application of 0.057 to 4.0g of Triacon per ha.(Ries, 1983)

MATERIALS AND METHODS

The varieties of the rice plant provided for experiments were S-235, S-287 and S-294. These varieties were sown on April 21, and transplanted on June 7, 1982. They were cultured with 4 treatments 4 replication and randomized block design and colleges standard methods were used.

Treatment were CaCl_2 5mM+Triacon 10, (Concentration) CaCl_2 10 mM+Triacon 10, (Concentration)

Table 1. Effect of Triaconanol spray on yield of S 235

Treatments	Grain wt.(g) per 24 hills	Panicle no. per hill	Grain no. per panicle	1000 seed wt.(g)
Control	658.8	18.41	95.47	18.25
Triacon 10+ 5 CaCl ₂ mM	728.8	19.68	101.6	19.25
Triacon 10+10 CaCl ₂ mM	756.3	20.24	123.5	19.50
Triacon 10+15 CaCl ₂ mM	726.3	19.51	103.5	19.50
	127.6**	N.S.	219.4**	N.S.

Table 2. Effect of Triaconanol spray on yield of S 287

Treatments	Grain wt.(g) per 24 hills	Panicle no. per hill	Grain no. per panicle	1000 seed wt.(g)
Control	538.8	15.92	89.27	18.75
Triacon 10+ 5 CaCl ₂ mM	583.8	17.23	89.81	19.50
Triacon 10+10 CaCl ₂ mM	626.3	17.55	113.7	20.00
Triacon 10+15 CaCl ₂ mM	586.3	18.44	101.6	19.25
	246.3**	6.882*	361.9**	N.S.

Table 3. Effect of Triaconanol spray on yield of S 294

Treatments	Grain wt.(g) per 24 hills	Panicle no. per hill	Grain no. per panicle	1000 seed wt.(g)
Control	557.5	16.68	100.4	18.00
Triacon 10+ 5 CaCl ₂ mM	612.5	16.88	112.1	18.75
Triacon 10+10 CaCl ₂ mM	645.0	18.10	131.9	19.50
Triacon 10+15 CaCl ₂ mM	625.0	17.75	110.4	18.75
	103.6**	N.S.	25.97**	N.S.

CaCl₂ 15 mM+Triacon 10, (Concentration), 4 treatment, each treatment pH 10 correctly adjust.

Harvest of 26 October, unhilled rice yield and factor of yield were investigated.

RESULTS AND DISCUSSION

The increased yields of grain were in 14.8%, S-235(Sam-Pung) in 16.2%, S-287(Tai-Baik) in 15.7%, S-294(Nam-Pung).

Triacon was sprayed once at the stage of 3~4 leaves, the day matter was increased vigorously in almost plants and it was considered to have the tolerance of blight and harmful insects as its early growth was vigorous.

It seems that the cooperative action of Triacon and Ca⁺⁺ took place, but its mechanism has not yet been known. In case of the rice plant, agricultural chemical was sprayed three times and it grew healthily. As a result, the number of tillers and grains increased. It seems that the difference of yield depends upon the activity of the suction power of mineral nutrients in root. The height of the rice plant and its 1,000-grains weight were similar to those of the control. A wide difference was observed between each varieties as indicated by Patil V.A.(1982).

According to Ries (1983) however, the yield of other crops is far greater in the United States than that in Korea. This may be considered attri-

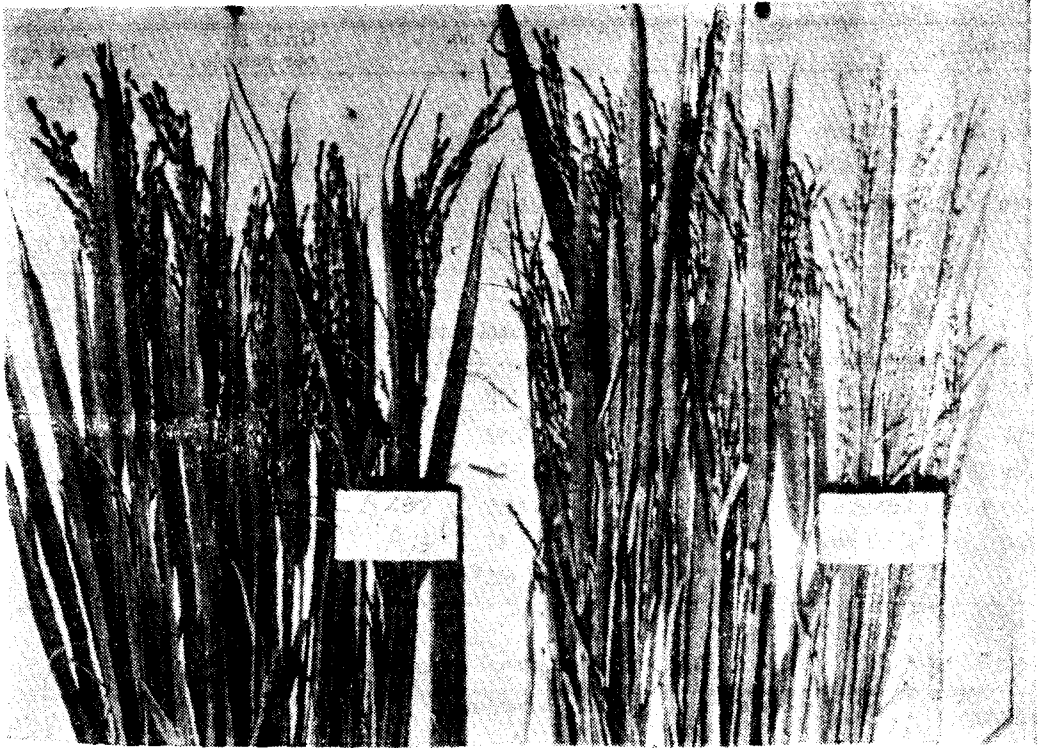


Fig. 1. The spikes of control(left) and triacon treatment(right) after heading. (S-287)

butable to soil, temperature and seed. It may be expected that the yield of crops will be more increased should the formula of Triacon is modified. In conclusion, Triacon can be fully presumed to play an epochal role in the production increase of good grains. It is interesting to note that Triacon differs from conventional chemical in that it increases both the quantity and quality of food grains and that it can be used with the mixture of Ca^{++} adjusted the pH. pH is regarded as an important factor in the application of Triacon, which is also different from other hormone.

Triacon is expected to be used for all crops. According to Kim, (1982) saponin of Ginseng was increased by 2.50~3 times and the yield of comfrey and clover was also increased. Therefore Triacon is considered to have significant effect on all farm products and its cheap price and simpleness in application will make it as the most promising

chemical in the future.

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摘 要

벼 수량을 알기 위하여 3품종 S-235(삼풍) S-287(태백), S-294(남풍), 대조구를 서울 농대 실험포장에서 1982년에 실험하였는데 4처리, 4반복, 난피법으로 하였다. 正稈은 S-235가 14.8%, S-287이 16.2%, S-294는 15.7% 증가하였다.

각 품종에서 각각 1%에서 유의성이 있었다. 가장 수량이 높은 것은 Triacon 10과 $CaCl_2$ 15 mM이다.

앞으로 이 문제는 더 많은 연구가 있어야 한다고 생각한다.

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