

POST ANTHESIS PGR APPLICATION AND FIRST AND SECOND CROP PRODUCTION IN DRILL-SEEDED RICE

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ABSTRACT

Second crop growth originates from axillary buds located at nodes along the culm of the rice plant. These buds begin actively growing after the crop matures and is harvested. This second crop growth is limited by declining temperature and day length during the fall. Initiating growth of a second crop early has the potential to permit heading and grain filling to occur under more optimum conditions. Evaluations of plant growth regulators applied to the first crop to enhance second crop production were conducted.

Cocodrie, a variety that matures early and can produce a second crop, was drill-seeded on 7-in row spacings on March 26, 2004. Plot size was 8.75 (15 rows) x 23 ft. Customary agricultural practices were followed to provide adequate pest control and water management for the first and second crops. Plant growth regulators (PGRs) were applied during the dough stage of the first crop (July 30). Rates of 2,4-dichlorophenoxy acetic acid, 2,4-D, (Amine 2,4-D Weed Killer, Platte Chemical Co., Fremont, NE); N-(2-chloro-4-peridiny1)-N'-phenyl urea, CPPU, (Prestige, Valent U.S.A., Walnut Creek, CA); trinexapac-ethyl, TE, (Palisade, Syngenta Crop Protection, Inc., Greensboro, NC); mefluidide, MF, (Embark, PBI/Gordon Corp., Kansas City, MO); and maleic hydrazide, MH, (Royal MH-30 SG, Chemtura, Middlebury, CT) were variable and as follows: 2,4-D: 1.13, 11.3, and 113 g/A; CPPU: 0.25, 2.5, and 25 g/A; TE: 14 g/A; MF: 0.25 and 0.5 lb/A; and MH: 1.5 and 3 lb/A. Crop growth and production were unaffected by rates.

First crop growth and maturity were unaffected by the PGRs, and yield was decreased by the mitotic inhibitors. Mature plant height ranged between 105 and 107 cm, and grain moisture at harvest ranged between 18.4 and 19.0% for the PGRs and control. Grain yield ranged between 7395 and 7408 lb/A for 2,4-D, CPPU, TE, and the control. Grain yields with MF (6682 lb/A) and MH (6458 lb/A) were significantly reduced.

Early second crop growth was noticeably affected by the PGRs that had affected first crop yield. Leaf density (leaves above the stubble of the first crop) at 12 days after harvest (DAH) was significantly higher following MF and MH (10 and 11 leaves/ft²) compared with the other PGRs and control (1 to 5 leaves/ft²). Similarly, at 20 DAH, panicle densities with MF and MH were 4 and 7 panicles/ft² compared with 3 panicles/ft² or fewer for the other PGRs and control. At maturity, the effects were less. Plant height ranged between 68 and 71 cm, grain moisture between 15.3 and 16 %, and grain yield between 2356 and 2430 lb/A for the PGRs and control.

Total yield (first plus second crop) was influenced just as first crop grain yield. Grain yield ranged between 9753 and 9814 lb/A for 2,4-D, CPPU, TE, and control. Grain yield with MF (9112 lb/A) and MH (8881 lb/A) were significantly lower.

Plant growth regulators applied to the first crop in rice can impact the second crop. Mitotic inhibitors like mefluidide and maleic hydrazide can be injurious to the first crop and enhance second crop growth. Further studies are needed to define the influence of plant growth regulators on second crop production.

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