

COTTON RESPONSE TO HYDRAHUME AND CORON FOLIAR NUTRIENT APPLICATION

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ABSTRACT: HydraHume is a product containing humus-derived organic acids. The advertised potential benefits of HydraHume are improved uptake efficiency of applied fertilizers. A study was conducted in 2004, evaluating sidedress applications of HydraHume in combination with 80 and 53 lb N/ac rates, and foliar applied slow release N applications (CoRoN) effect on yield. CoRoN, 10-0-10 (N-P-K) formulated with 0.5% boron (B) was applied as sequential applications starting at first bloom and repeated 12 days after first bloom. The study mean seed cotton and lint yield was 2052 and 852 lb/ac, respectively. HydraHume in combination with 80 or 53 lb N/ac did not increase yield compared to the 80 or 53 lb N/ac with no HydraHume. CoRoN applied at pinhead square and repeated 12 days later in combination with 80 or 53 lb N/ac applied sidedress did not increase yield compared to the 80 lb N/ac sidedress treatment. The study indicated no differences between treatments with 80 or 53 lb N/ac. However, the trend was for higher yield with 80 lb N/ac than the 2/3 recommended rate (53 lb N/ac).

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KEYWORDS: Foliar nutrients, HydraHume, cotton, CoRoN

MATERIALS AND METHODS: A study was conducted on a Leeper silty clay loam soil evaluating the effect of sidedress nitrogen applications in combination with HydraHume plus foliar applications of CoRoN on yield. CoRoN was applied as sequential applications starting when all plants had at least one bloom with a repeat application 12 days later (Table 1). The study was conducted as a randomized complete block design with 4 replications. Plot size was 4 rows (38 inch) x 50 ft.

Potash (K₂O) at 200 lb/ac, super phosphate (0-46-0) at 100 lb/ac, and zinc sulfate (31%) at 10 lb/ac as a blend mixture was applied broadcast to the soil surface on 10/24/03. The plots were flail mowed 10/22/03; paratilled (12-in depth) on 10/24/03, bed rolled on 10/24/03, and doaled prior to planting on 5/04/03. DP 444BR cotton variety was planted on 5/04/04. Roundup WEATHERMAX (glyphosate) + Clarity (dicamba) at 1.0 + 0.25 lb ai/ac was applied as a burndown application on 3/15/04. A second burndown application of Roundup WEATHERMAX at 1.0 lb ai/ac was made 4/27/04. Roundup WEATHERMAX at 1.0 lb ai/ac was applied early postemergence on 5/24/04. Suprend (prometryn + trifloxysulfuron) + MSMA (monosodium acid methanearsonate) at 1.0 + 2.0 lb ai/ac was applied post directed broadcast layby on 7/6/04. Staple (pyrithiobac) + Assure II (quazalofop) at 1.0 oz ai/ac + 0.069 lb ai/ac was applied postemergence on 6/10/04.

Nitrogen as liquid UAN at 80 and 53 lb N/ac was applied sidedress to 6-leaf cotton, 6 inches from the row and 2 inches deep on 6/10/04. The 53 and 80 lb N/ac included HydraHume at 1 gpa applied as a sidedress application at pinhead square. Boom height was 20 inches above the tallest cotton. The first application was made 7/7/04 with a repeated application 12 days after first application. HM 9826A (12-0-0, 0.5% B) was applied to match head square cotton and Phos-cal at 4 pt/ac was applied 7/9/04 to all treatments, except treatment 9, when 50% of the plants had bloomed. Foliar CoRoN (10-0-0, 0.5%B) applications were made at 1 gallon in a 5 gpa spray volume with water as the carrier. The applications were made using TXV5-4 nozzles on 20-inch spacing with a boom height of 20 inches above the cotton and a 40 psi boom pressure.

The major cotton insect pests during growing seasons were tarnished plant bug (*Lygus lineolaris*), budworm (*Heliothis virescens*), and bollworm (*Helicoverpa zea*) and infestations were low. Appropriate cotton insecticides were applied when insect populations reached threshold level based on twice weekly scouting reports. All insecticide applications were made with TXVS-4 nozzles, 5 gpa carrier volume, 48 psi, and a 4 mph rate of travel Bidrin (dicrotophos) at 0.25 lb ai/ac was applied 6/14/04 for plant bug control. Centric (thiamethoxam) at 0.05 lb ai/ac lb ai/ac was the only insecticide applied on 8/02/04 for bollworm control.

Pix (mepiquat chloride) at 0.106 lb ai/ac was applied 7/8/04 and repeated at 0.08 lb ai/ac on 7/16/04 to control rank cotton growth. Cotton was defoliated when the cracked boll on the first fruiting branch position was 4 nodes from the upper most harvestable boll. Cotton was defoliated with Finish (ethephon + cyclanilide) + Dropp (thidiazuron) at 1.5 + 0.19 + .083 lb ai/ac on 9/10/04. The center 2 rows of cotton were harvested with a 2-row spindle picker on 9/20/04. Plot seed cotton weights were recorded. Grab samples from each plot of seed cotton were collected and ginned with an 8-saw micro-gin (no lint cleaners, seed cotton cleaners or dryers) to determine percent gin turnout and lint yield. All data were analyzed with analysis of variance procedure and treatment means were separated with Fisher Protected LSD calculated at the 5% significance level.

RESULTS AND DISCUSSION: Season long air temperatures ranged from normal early to mid season with below normal temperatures in late August through September. Rainfall was highly variable with 114 and 153% of normal for May and June, respectively, followed by a 4-week period of no rainfall from July 20 through August 20. However, cotton yield was slightly above average. Seed cotton yields ranged from 1977 to 2199 lb/ac, with a study mean yield of 2052 lb/ac (Table 1). The mean percent lint turnout was 42.0 with no difference between treatments. Lint yields ranged from 790 to 917 lb/ac with the study mean yield of 856 lb/ac. All 80 and 53 lb N/ac sidedress application treatments with or without CoRoN or HydraHume showed no seed cotton, lint yield, or lint percent differences. However, the trend was for higher yield with 80 lb N/ac than the 2/3 recommended rate of 53 lb N/ac.

COOPERATORS: None

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Table 1. HydraHume and N rate sidedress application combinations, and foliar CoRoN applications effect on seed cotton, lint percent, and lint yield on a Leeper silty clay loam soil in 2004, Verona, MS.

Treatment ³	Rate/ac	Application growth stage	Seed cotton lb/ac	Lint lb/ac	% Lint
1. UAN	80 lb N	SD-PHS ¹	2184	898	41.1
2. UAN HydraHume	80 lb N 1 gpa	SD-PHS SD-PHS	2082	872	41.2
3. UAN CoRoN (10-0-10; 0.5% B) CoRoN (10-0-10; 0.5% B)	80 lb N 1 gpa 1 gpa	SD-PHS 1 st Bloom 12 DAB ²	2113	873	41.3
4. UAN HydraHume CoRoN (10-0-10; 0.5% B) CoRoN (10-0-10; 0.5% B)	80 lb N 1 gpa 1 gpa 1 gpa	SD-PHS SD-PHS 1 st Bloom 12 DAB ²	2199	917	41.2
5. UAN	53 lb N	SD-PHS	1977	832	42.1
6. UAN HydraHume	53 lb N 1 gpa	SD-PHS SD-PHS	1977	831	42.0
7. UAN CoRoN (10-0-10; 0.5% B) CoRoN (10-0-10; 0.5% B)	53 lb N 1 gpa 1 gpa	SD-PHS 1 st Bloom 12 DAFB ²	1948	812	41.7
8. UAN HydraHume CoRoN (10-0-10; 0.5%) CoRoN (10-0-10; 0.5%)	53 lb N 1 gpa 1 gpa 1 gpa	SD-PHS SD-PHS 1 st Bloom 12 DAFB ²	1886	791	41.9
9. UAN CoRoN (10-0-10; 0.5%) CoRoN (10-0-10; 0.5%)	80 lb N 1 gpa 1 gpa	SD-PHS 1 st Bloom 12 DAFB ²	2103	873	41.5
		Grand mean	2052	852	42.0
		LSD (0.05)	NS	NS	NS
		% CV	8	7	1.9

¹ SD-PHS means applied sidedress at pinhead square, 6 inches from the row and 2 inches deep.

² DAB means days after first bloom application..

³ Treatments 1 through 8 also received HM9826 (12-0-0, 0.5%B) at 2 pt/ac (pinhead square) and Phos-Cal at 4 pt/ac when 50% of plants had bloomed. Treatment 9 did not receive these applications.