

QUARTERLY PROGRESS REPORT: YEAR 3 of 3 (2006-07)

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**VARIABLE RATE FERTILIZATION FOR
ENHANCEMENT OF RIDGE CITRUS N-BMPs**

by

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PROGRESS DURING OCTOBER 2006 TO FEBRUARY 2007

Two new field experiments were initiated with Gapway Groves in October to demonstrate the fertilizer savings when using a variable rate fertilizer spreader. Previous research conducted in 2004-2006 showed that in a highly variable mature grove of Valencia oranges, up to 40% fertilizer savings were possible with variable rate fertilization. We wanted to obtain additional data of fertilizer savings from more 'average' groves, that were less variable and with spacing that is more typical of newer Ridge citrus. In these initial demonstrations, two moderately variable grove blocks were fertilized at variable rates according to tree size in the configuration below (Fig. 1), and the amount of fertilizer N consumed was compared to the amount which would have been applied to the same blocks at uniform fertilization rates by the grower (240 lb/ac/year).

Gapway VRA fertilizer demos: started 17th October 2006

Spreader configuration:

Tree height, feet	N rate, lb/ac/year
0-3	0
3-8	120
8-13	160
13-18	200
>18	240

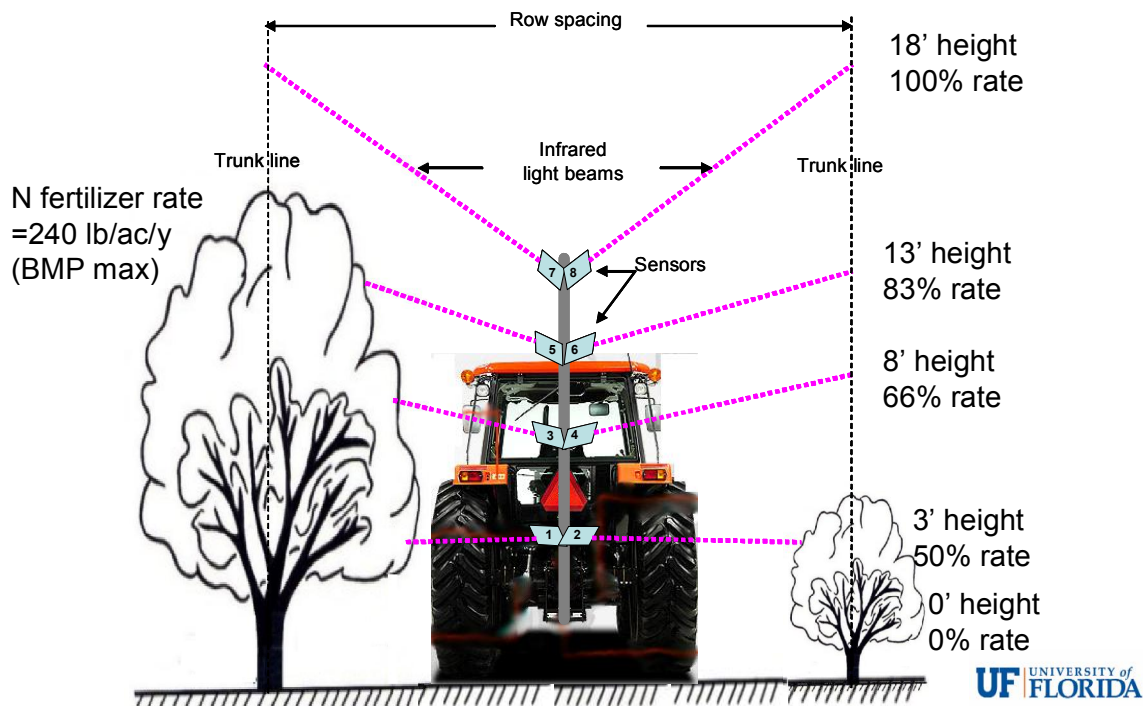


Figure 1. Geometric configuration of the eight Banner® infrared sensors to detect different tree sizes

Summary Results:

Block 23 and 24 (Fig. 2)

spacing = 25x20; 26.25 ac

7,508 lb applied; target rate was 60N = 400 lb/ac of 15-0-17

At uniform rate, would have applied 26.25 ac x 400 = 10,500 lb

Fertilizer saved = 28.5%

Eastern block by office (Fig. 3)

spacing=25x12.5; 25.78 ac

8,454 lb applied; target rate was 60N = 400 lb/ac of 15-0-17

At uniform rate, would have applied 25.78 ac x 400 = 10,312 lb

Fertilizer saved = 18.0%

Remaining material in the hopper spread on 8 southern rows east of block 23 and 24 (Fig. 2): **1,097 lb applied uniformly on 2.67 ac = 411 lb/ac**

These experiments in typical Ridge Valencia groves demonstrated that substantial fertilizer savings of 18-29% were possible when using variable rate fertilizer spreaders. Although less than the 40% savings in the extremely variable old groves in Ft. Meade, a 20-30% reduction in N loading is expected to significantly reduce nitrate contamination of underlying groundwater. Furthermore, with rising fertilizer prices, the substantial saving of fertilizer will help make any citrus production on the Ridge more profitable.



Figure 2. Aerial photograph of the first Valencia grove with wide in-row spacing (20 feet).



Figure 3. Aerial photograph of the second Valencia grove with narrow in-row spacing (12.5 feet).