

## Research Note

### THE INFLUENCE OF CORM SIZE ON INITIAL PLANTAIN GROWTH<sup>1, 2</sup>

Plantain (*Musa acuminata* X *M. balbisiana*, AAB) ranks second only to sugarcane as the most important agricultural crop in Puerto Rico. Because of favorable prices, farmers are eager to grow this crop. When possible, the farmer may use large seed pieces (corms) weighing from 3 to 5 lb to insure good growth until first fertilizer application at from 4 to 6 weeks after planting. With shortages of planting material, the farmer must use smaller size corms. However, he still applies his fertilizer from 4 to 6 weeks after planting. An experiment was performed to determine the relationship of corm size and fertilizer application to plantain growth up to 6 weeks after planting and the results are given in this paper.

The experiment was conducted in the greenhouse using the nutrient-sand culture technique to study the influence of corm size on the growth of plantains with and without fertilizer. Quartz sand in 8-liter glazed pots rather than soil was used in this study to obtain a clear concept of the nutrients available for growth from the corm in the early stages of growth. It was assumed that a complete nutrient solution throughout the first 6 weeks would approximate an application of fertilizer to the soil at time of planting. The no-fertilizer treatment would approximate the application of fertilizer at 6 weeks. In actual field practice, the soil supplies some nutrients to the plant regardless of the time of fertilizer application. However, using a nutrient-sand culture technique permitted determination of the extreme nutritional demand limits plantain undergoes during the first 6 weeks without the complications of the variables of soil nutrient availability.

The experiment included six corm sizes: 454 g (1 lb), 681 g (1.5 lbs), 908 g (2 lbs), 1135 g (2.5 lbs), 1362 g (3 lbs), and 1589 g (3.5 lbs). Within a given corm size treatment, the variation range was  $\pm 50$  g of the stated size. Each corm size was given two fertilizer treatments: complete, and none. The complete nutrient solution<sup>3</sup> was applied every other day, with

<sup>1</sup> Manuscript submitted to the Editorial Board June 22, 1976.

<sup>2</sup> Appreciation is expressed to Dr. Alex G. Alexander, Physiologist of this Station for his excellent cooperation in planning and carrying out the greenhouse sand culture experiment reported herein.

<sup>3</sup> Nutrient concentrations, expressed as meq/liter, were provided as follows: N-NO<sub>3</sub>, 15; P, 6; K, 12; Ca, 3; Mg, 2; and S, 2. Microelements; expressed as p/m were supplied as follows: B, 0.05; Cu, 0.02; Mn, 0.50; Zn, 0.05; Mo, 0.01; and Fe, 0.50.

tap water applied on alternate days. The no-fertilizer treatment received only tap water. The experiment was planted on March 26, 1975 and harvested 44 days later. The experimental design was a split-plot with six treatments at the whole-plot level and two treatments at the sub-plot level replicated three times.

At harvest, after the sand was washed away, each plant was divided into roots, corm, pseudostem, and leaves. Each was weighed and samples were oven-dried and then composited for chemical analyses.

Table 1 shows the effect of size of the corm on the first 6 weeks' growth. Significant increases in above-ground weight were obtained by increasing corm size. Corms 908 to 1362 g (2 to 3 lbs) appear to be the

TABLE 1—*The influence of corm size with and without fertilizer on growth of plantains 6 weeks after planting*

Initial weight of corm	Above-ground green weight		Height of plant at 6 weeks	
	-NPK	NPK	-NPK	NPK
<i>G</i>	<i>G</i>	<i>G</i>	<i>Cm</i>	<i>Cm</i>
454 (1) <sup>1</sup>	125 a <sup>2</sup>	349 a	23 a	35 a
681 (1.5)	253 a	759 a	28 ab	43 b
908 (2)	332 bc	616 ab	23 a	45 b
1135 (2.5)	356 bc	697 bc	37 b	49 b
1362 (3)	438 c	742 c	38 b	50 b
1589 (3.5)	424 c	796 c	38 b	54 b
Average	393	630	31	46

<sup>1</sup> Numbers in parentheses refer to weight in pounds.

<sup>2</sup> Values in a column with one or more letters in common do not differ significantly at the 5% level.

optimum size. The fertilized corms produced a 60% increase in above-ground weight over that of those receiving no fertilizer.

A 454 g (1 lb) corm fertilized during the first 6 weeks grew as well as a 908 g (2 lb) nonfertilized corm. The above-ground weight of a 681 g (1.5 lb) fertilized corm was greater than that of an unfertilized corm weighing 1135 g (3.5 lb). Thus, fertilizing small-sized corms (454 to 681 g) during their first 6 weeks can give as good growth as using larger-sized planting material.

Response to corm size, measured by plant height, was not evident beyond the 681 g corm size at 4 weeks after planting for either fertilized or non-fertilized corms. At 6 weeks after planting, the plants from unfertilized corms of 1135 g or more were significantly taller than those from smaller corms (table 1). However, when fertilized, only the smallest corms—454 g—produced shorter plants than those of other weights.

Results show that if planting material is scarce, small corm sizes 454 to 908 g (1 to 2 lb) can be used if they are fertilized at planting. Even larger-sized corms showed greater growth if fertilized during early growth instead of at 6 weeks after planting.

*George Samuels*  
*Agronomy and Soils Department*