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1. Modification of expression of the gene "rootless."

During 1966 and 1967, further studies were carried out utilizing treatments of growing plants with various combinations, strengths and frequencies of application of the growth substances naphthalene acetic acid (NAA), tri-iodo benzoic acid (TIBA), gibberellic acid (GA), and indole butyric acid (IBA). Dimethyl sulfoxide (DMSO) was found to enhance the efficacy of TIBA treatments in inducing rooting, providing the amount used was .5 ml per liter of TIBA solution. Above this amount, tissue death occurred in the margins of leaves.

Ontogenetic studies were done during 1967 on the number of roots initiated per node per week for 7 weeks for each of 38 different treatments. All plants were derived from seed obtained by self-pollination of "really rootless" plants in 1966, and mixed before planting.

Control plants showed 10-15 roots on 6 nodes initiated by 7 July; by 1 August, sister plants had only 1-7 roots on 1-3 nodes. By 15 August the total number had climbed to 15-22 on 5-7 nodes, but by 21 August had declined to 2-20 on 1-6 nodes, with several to all roots completely dead, yet with plants showing no signs of water shortage. NAA treatments, by contrast, showed 23 roots on 7 nodes in early July and 79-85 roots on 9 nodes by 21 August, with no decline around August 1. GA, normally a root inhibitor, showed no decreases in number of roots formed nor in nodes initiating roots, and actually caused slight increases consistent over the growing season (17 roots initiated by 10 July on 5 nodes; 15 roots on 7 nodes on August 21, all living). TIBA-treated plants showed 14 roots on 5 nodes on 8 July, an increase up to 34 on 9 nodes by August 1 and a drop back to 30 roots on 9 nodes by 21 August. IBA-treated plants showed a generally larger number of roots when compared with controls, with 20 roots from 6 nodes on 10 July, a drop to 11 on 4 nodes on 1 August and 13-17 roots on 6 nodes by 21 August.

Treatments with TIBA at 3-day intervals showed a higher number of roots on 1 August (26-31 at 7-8 nodes) than on 10 July (15 at 4 nodes) or on 21 August (3-20 on 5-7 nodes). Treatments with GA and IBA showed similar increases in numbers of roots per node without a dropoff around 1 August.

Combinations of treatments and spacings of application in general followed these basic findings. The most extreme development of roots occurred under a regimen of NAA and GA on alternate days, followed by two days without treatment; 231 roots were formed on 8 nodes by 21 August. TIBA-NAA on an every-other-day treatment regimen also produced high root numbers (80 roots on 9 nodes by 21 August).

Fresh weight-dry weight comparisons of roots and shoots show the clear relationship between treatments and root system size, as well as the general relationships between shoots and roots.

## Family 66-10 (really rootless)

Treatment	Root Weight (g)		Shoot Weight (g)	
	<u>Fresh</u>	<u>Dry</u>	<u>Fresh</u>	<u>Dry</u>
Dist. water	8.5	3.2	694.4	110.0
TIBA	41.0	15.7	455.0	82.7
GA	98.9	15.1	709.2	113.5
NAA	244.2	49.4	693.3	105.5
IBA	4.3	.9	683.8	104.4
Control	3.6	1.6	1671.5	244.2

Norton H. Nickerson

2. Races of maize in Panama.

As a part of the Bio-Environmental effort to appraise effects of a sea-level canal in Darien, Panama, I was asked to make a study of cultivated crops among the Choco Indians this past fall. Internodal and tassel data on 5 - plant samples from each of 10 Indian fields were obtained. Soil and kernel samples were obtained for mineral analysis by the University of Florida. Seventeen collections of maize, totalling 118 ears, were obtained from various locations on the major drainages of the area, Rio Sabana, Rio Chucunaque, Rio Tuirra, and Rio Balsas (Rio Tucuti). Preliminary study shows evidence of more complex race relationships than had previously been assumed.

These may be tentatively summarized as follows:

Race designation	# of Collections in which racial characters are present	# of ears exhibiting racial characteristics
Nal-Tel	8	33
Cuban Flint	4	13
Chococeño	7	24
Coastal Tropical Flint	8	51
not the same {	Negrito	4
	Negro	1
Cariaco	1	8
Pollo (?)	1	2
Capio	1 (plants measured; no ears obtained)	