

The sugar industry of Louisiana has to contend to some considerable degree, against climatic disadvantages. The harvest of the cane has to begin at an early date, to escape the destructive influence of the frost. The planter of Cuba begins his operations frequently after the sugar season of Louisiana has closed. As the formation of the cane sugar in the sugar-cane, similar to that noticed in other sugar bearing plants, takes place largely during the last stages of its growth, it seems essential for the best success attainable in Louisiana, and similarly situated localities, to ascertain in particular the circumstances which favor an early maturity of the cane, without interfering with its normal development. Systems of cultivation as well as of fertilization, are known to exert, each in their own way, more or less influence on the duration of the period of growth. The history of the growth of the sugar-cane in Louisiana is but little known. To study systematically, by chemical and optical tests, the changes which the composition of the cane juice suffers during the advancing growth of the sugar-cane, can only increase the chances of success.

XXIX.—CONTRIBUTION FROM THE CHEMICAL LABORATORY OF THE
MASSACHUSETTS AGRICULTURAL COLLEGE.

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SUGAR IN CORN-STALKS AND MELONS.

The examinations which form the main subject of this communication, were instituted for the purpose of testing the fitness of the juice of corn-stalks and melons, raised in our section of the country, 1876-1878, for the manufacture of sugar and syrup—an application which has been, of late, recommended. The tests were made under my direction by Mr. E. B. Bragg, a graduate of the Massachusetts Agricultural College.

1878.

Fodder Corn (Maize).

Aug. 19.—Vigorous plants of Northern corn, sown for fodder upon the College farm, with the tassels just appearing, were cut off six inches above the ground, and from two to three feet of their tops, besides their entire leaf mass, removed. The remaining canes were crushed and pressed by a hand-press, to secure their juice.

Canes (fresh cut) lost moisture at 100° C.	84.82 per cent.
Canes left dry vegetable matter at 100° C.	15.18 “
Spec. gravity of juice, 5.9° Brix, at 27° C. temp.	
Grape sugar in juice.....	4.35 per cent.
Cane sugar in juice.....	0.28 “

Black Mexican Sweet Corn.

Aug. 27.—The ears were just ready for the table when the juice of the canes was tested.

Canes lost moisture at 100° C.....	82.56 per cent.
Canes left dry vegetable matter at 100° C.	17.44 “
Spec. gravity of juice, 12° Brix, at 27° C. temp.	
Grape sugar in juice.....	2.06 per cent.
Cane sugar in juice	7.02 “

Evergreen Sweet Corn.

Aug. 28.—This variety of corn was in the same advanced state of growth as the previous one: i. e., the ears just fit for the table.

Canes lost moisture at 100° C.....	79.62 per cent.
Canes left dry vegetable matter at 100° C.	20.38 “
Specific gravity of juice, 12.7° Brix.	
Grape sugar in juice.....	4.85 per cent.
Cane sugar in juice.....	5.70 “

Common Sweet Corn.

Sept. 11.—The corn was already somewhat hard when the stalks were cut to obtain the juice for examination; they had been cut a few days previous to their examination.

Specific gravity of juice, 8.7° Brix, at 26° C. temp.	
Grape sugar in juice.....	6.6 per cent.
Cane sugar in juice.....	none.

1876. *Common Yellow Musk-Melon.*

Sept. 7.—The fully ripened fruit, raised upon a sandy loam, furnished the juice for the tests.

Specific gravity of juice, 1.040, at 26° C. temp.	
Grape sugar in juice.....	1.67 per cent.
Cane sugar in juice.....	2.65 “

White Flesh Water-Melon, or Ice Cream Melon.

Sept. 6.—A large and ripe specimen served for the examination.

Specific gravity of juice, 1.025, at 18° C. temp.	
Grape sugar in juice.....	2.91 per cent.
Cane sugar in juice.....	2.16 “

Red Flesh Water-Melon.

Sept. 14.—A ripe fruit was tested.

Specific gravity of juice, 1.025, at 22° C. temp.	
Grape sugar in juice.....	3.57 per cent.
Cane sugar in juice.....	2.18 “

Sept. 18.—A ripe fruit like the above.

Specific gravity of juice, 1.025, at 19° C. temp.	
Grape sugar in juice.....	3.84 per cent.
Cane sugar in juice.....	1.77 “

Nutmeg Musk-Melon.

Sept. 11.—A full grown, yet *not ripe*, specimen gave the following results :

Specific gravity of juice, 1.030, at 19° C. temp.	
Grape sugar in juice.....	3.33 per cent.
Cane sugar in juice.....	2.11 “

Sept. 12.—A *ripe* specimen of the same kind of fruit yielded a juice showing a

Specific gravity of juice, 1.050, at 20° C. temp.	
Grape sugar in juice.....	2.27 per cent.
Cane sugar in juice.....	5.38 “

Sept. 11.—An *over-ripe* specimen gave the following results :

Specific gravity of juice, 1.030, at 19° C. temp.	
Grape sugar in juice.....	2.50 per cent.
Cane sugar in juice.....	1.43 “

The results of the investigation leave no doubt about the question that, in our climate, neither the corn-stalks nor the melons surpass the Early Amber Cane as a source for sugar or syrup manufacture. The present condition of our sugar and molasses industry offer but little inducement to raise any of these three plants, for the production of syrup to supply the general market.