AN EXPERIENCE WITH FOUR (04) MASSECUITE BOILING SYSTEM

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ABSTRACT

Considering the cane juice purities and higher purity of final molasses, it was decided to adopt 04 massecuite instead of 03 massecuite boiling system for raw side at the Sanghar Sugar Mills ltd. (SSML). This resulted in various ways like the overall purity control of massecuite and molasses, higher purity drops from massecuite to molasses, reduced sugar losses in molasses, 3-4 degree lower purity of final molasses and higher boiling house efficiency.

Key Words: Sugarcane juice, Massecuite boiling system, Pakistan

INTRODUCTION

Right from the start of the very 1st season (1987-88) of SSML the purity of final molasses remained high, i.e. 36-39° during all the crushing seasons. During the month of January to March when the cane juice purities are higher, the purity of final molasses tends to increase further. It may be mentioned that three massecuite (03) boiling system for raw side was adopted at SSML. In all these years of working of SSML i.e. 1987-88 to 2006-07, a number of measures were taken to bring down the purity of final molasses but not with much success.

Analysis of working

The average results of SSML from season 1987-88 to 2007-08 i.e. syrup purity, difference between syrup and A-massecuite purity, B,C massecuite, A-Heavy, B-Heavy, final molasses purities and purity drop between massecuite and molasses are given in table no.1.

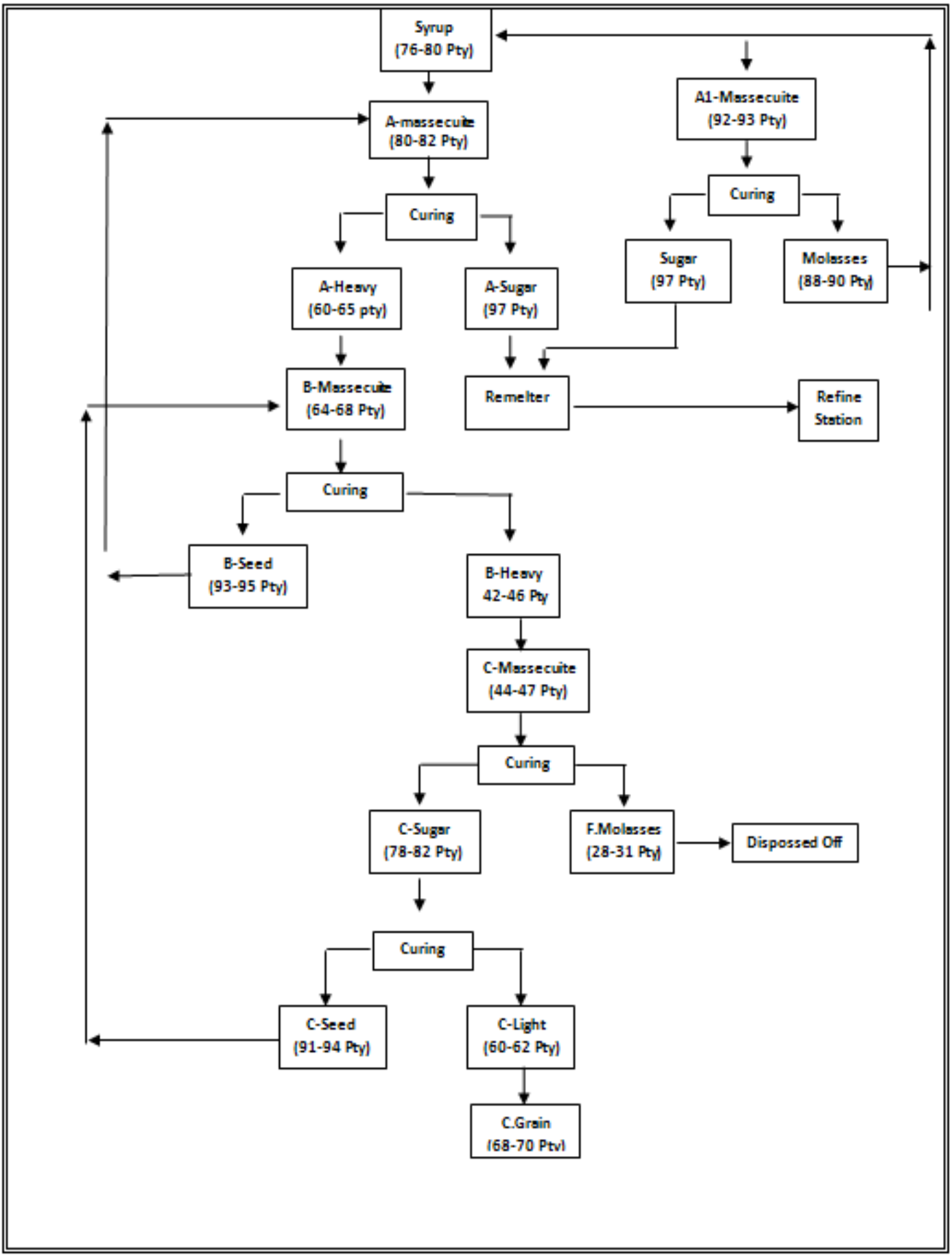
Table-1 Average purity of massecuite and molasses in SSML (1987-88 to 2007-08)

Material	Purity	Molasses	Difference between massecuite and molasses purity
Syrup	77.82	-------	-------
A-massecuite	83.20	A. Heavy 66.60	16.6
B-massecuite	69.60	B. Heavy 48.50	21.1
C-massecuite	53.70	F.Molasses 36.51	17.19
B.H.E	82.70		

From the Table No.1 it will be noted that there is a big difference of 6 degree between syrup and A-massecuite purity and related molasses purities are on higher side. Also due to higher purity of C-massecuite i.e. +53°, the purity of final molasses also remained high i.e. +36°.

Considering all the above factors and the results obtained so far, it was decided to adopt four massecuite boiling instead of three boiling system. Given below (Fig-1') is the schematic four massecuite boiling system adopted at the SSML since 2008-09.

Figure -1 Four boiling scheme diagrams is given as under



RESULTS AND DISCUSSION

It can be observed from Fig No.1 that in addition to A, B, C massecuite an extra massecuite A1 is introduced in the system. The A-1 massecuite is boiled with the help of run off 3rd molasses as footing and C/B Seed is taken for seeding then Run off 3rd is fed on it. Massecuite is dropped in a separate crystallizer and cured separately in a continuous centrifugal, its sugar is re-melted with A massecuite sugar and sent to Talo Clarifier station. The mother liquor is mixed with the syrup to boil "A" massecuite.

B-Seed and syrup is used to boil A-massecuite. A-heavy and "C" Seed is used for boiling of B-massecuite. All the extra B/c-seed is utilized in A1 massecuite. This additional boiling of A-massecuite probed to be very successful in bringing down the recirculation of sugar and molasses at pan station. The average results so obtained during 2008-09 to 2011-12 seasons are enumerated in table no. 2 as under:

Table-2 Average purity of massecuite and molasses in SSML (2008-2009 to 2011-2012)

Material	Purity	Molasses Purity	Difference between massecuite and molasses purity
Syrup	78.20	------	------
A-massecuite	80.10	A. Heavy 64.10	18.00
B-massecuite	66.20	B. Heavy 44.20	22.0
C-massecuite	47.40	F. Molasses 32.80	14.6
B.H.E	85.93		

If we compare the working results given in Table No.1 (three massecuite boiling system) with the results of Table No.2 (four massecuite boiling system) it is clear that the purity gap between syrup and A-massecuite considerably decreased and came down from 6 to 2°. The decreased purity of A-massecuite resulted in bringing down the purity of AH from 66 to 64°, similarly decreased purity of AH caused lowering down the purity of B-massecuite to 66° which was previously running in between 68-70°.

Lower purity of B-massecuite produced Lower purity of BH molasses (44°) and ultimately the C-massecuite purity dropped from 53° to 47° i.e. a difference of 5°. Lower purity of C-mass means lower purity of final molasses, (which was our main target) came down to 32° from 36°. The purity drops between massecuite and relative molasses also improved to a reasonable level, if it is compared with previous results. If B.H.E is compared given in Table No.1 with Table No.2, it can be observed that there is a re- markable improvement of 3° after season 2007-08.

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