MCX
METAL & ENERGY
Trade with Trust

MENTHA OIL
PERFORMANCE REVIEW



2019-2020

FOREWORD TO THE MENTHA OIL PERFORMANCE REVIEW

The Mentha Oil Performance Report (PR) is the outcome of the SEBI circular SEBI/HO/CDMRD/DNPMP/CIR/P/2020/21 dated February 04, 2020 directing all recognised Stock Exchanges offering commodity derivatives segment to create a 'Performance review of the commodity derivatives contracts'. The PR, based on SEBI directive, has to be uploaded on the Exchange website by June 30, 2020 after consultation with the respective Product Advisory Committee (PAC).

Following the above directive the Agri - Product Management Team (PMT) at the Exchange has created PRs for all the listed Agri products. These have since been prepared in consultation with the respective Commodity/Commodity Complex PACs.

The Mentha Oil Performance Report highlights the important aspects of the trade like the domestic and international supply, import and export statistics, etc. There is also extensive information on the volume, turnover, open interest, deliveries of Mentha Oil on the Exchange, along with the price correlations with spot markets and hedging efficiency to help the market participants get an empirical understanding of the performance of the Mentha Oil contract on the Exchange.

Acknowledgement

We have been ably guided by the MCX Mentha Oil PAC members in improving the content of the report and we are extremely thankful to them. We hope to keep improvising the report going forward.

1. **Background**
    a. **Brief about the commodity such as sample picture, lifecycle and various varieties/grade of the commodity found in India**

Brief about Mentha Oil

Menthol mint/ Japanese mint/Corn mint (Mentha arvensis) is cultivated since antiquity in Japan and during recent years in China, India, and Brazil. Mentha oil (also known as Japanese or Chinese or Brazilian mint oil) is valued as a source of l-menthol, which is generally obtained by simple freeze-crystallization. Dementholized oil, a by-product is used as an inexpensive, rather harsh mint like oil.

Prior to 1940, Japan was the supplier of 70% of world's total requirement of Menthol mint, with a total production of 600 to 800 MT per annum. During the Second World War the cultivation started in Brazil and it reached to 2800 MT thus surpassing Japan. But in 1984 Brazil showed a sharp decline from 5000 MT to nearly 100 -200 MT. Thereafter China reached at the top by producing 6000 MT of Mentha oil. In modern times production of Mentha oil shifted to India. Currently India contributes to approximately 80% of world production of Mentha oil.

Sample Picture of Mentha Oil



Lifecycle

Nursery for Mentha oil is generally prepared in Jan (mid)-Feb (end). After 25-30 days in nursery, seedlings get transplanted from nursery to fields in the month of March-April. First cutting is done after 90 days of transplantation and second cutting is done after 60 days of first cutting.

Distillation of leaves are generally done at farm level with the help simple distillation units. Generally by end of May or beginning of June arrival of Mentha oil starts in mandis.

Varieties/Grade of Mentha

Japanese mint (Mentha arvensis), Peppermint Oil (Mentha piperita), Spearmint Oil (Mentha spicata) are important types of Mentha. The contract listed on the Exchange platform is of Mentha arvensis.

There are several varieties of Mentha arvensis. Important varieties of Mentha arvensis are:

Shivalik: It is an introduction from China. This variety is highly suitable for obtaining second cut. Shivalik is highly sensitive to the fungal diseases and pests prevailing in the Tarai area.

Himalaya: This variety yields high amount of essential oil and is not susceptible to pests and diseases. Like Shivalik, Himalaya can be ratooned for two cuts.

Hybrid 77: It is a tall vigorous compact growing variety. It is highly resistant to rust diseases.

EC-41911: This is an erect type variety, which gets less affected by rains. The oil extracted from this variety is preferred in food flavors.

CIM Kosi: A novel mint plant 'Kosi' characterized by its high menthol content, high biomass and high oil yield with symmetrical branching giving globular shape to the canopy for equal distribution of sunlight to the lower leaves.

CIM Kranti: This variety has a unique genotype with better performance in terms of essential oil yields during winters. Therefore CIM-Kranti could be used for both, essential oil and sucker production. This variety demonstrated tolerance towards cold and showed potential of giving higher additional essential oil yields during winters.

b. Commodity fundamentals and balance sheet as per the following format (to be prepared based on publicly available information on best effort basis):

Table – Fundamentals & Balance sheet

Global Scenario	**2018-19**	**2019-20**
Opening Stocks	NA	NA
Production	40,000-50,000	40,000-50,000
Consumption	40,000-50,000	40,000-50,000
Closing stocks	NA	NA
All figure are in MT, NA=Not available **Source – Market Estimates**		

Indian Scenario	**2018-19**	**2019-20**
Opening Stocks	3000-4000	2000-3000
Production	37,000	37,000
Imports	0	0
Total Supply	40,000-41,000	39,000-40,000
Exports*	30,871	NA
Domestic consumption	7,000-8,000	7,000-8,000
Closing stocks	2000-3000	2000-3000
All figure are in MT, *Spice Board India "@70% oil" **Source – Market Estimates, NA=Not Available**		

Top Major producing countries	**2018-19**	**2019-20**
India	37,000	37,000
China	4,000-5,000	4,000-5,000
Others	5,000-7000	5,000-7000
All figure are in MT **Source – Market Estimates**		

Top 10 Major consuming countries	2018-19	2019-20
China	19968	NA
India	7000	NA
U.S.A	3559	NA
Japan	3514	NA
Singapore	1170	NA
Netherlands	710	NA
Germany	707	NA
France	533	NA
Indonesia	513	NA
U.K	404	NA
All figure are in MT, NA=Not available **Source – Market Estimates (Production + Import - Export)**		

Top Major exporting countries	2018-19	2019-20
India	30,871	NA
All figure are in MT, NA=Not available **Source – Spices Board India; @70% Oil**		

Top 10 Major importing countries (from India)	2018-19	2019-20
China	15467.60	NA
U.S.A	5084.47	NA
Singapore	1671.31	NA
Netherlands	1013.86	NA
Germany	1010.53	NA
France	760.74	NA
Japan	783.53	NA
U.K	577.24	NA
Indonesia	732.59	NA
Philippines	451.69	NA
All figure are in MT, NA=Not available **Source – Spices Board India; @70% Oil**		

Top Major producing states in India (MT)	2018-19	2019-20
Uttar Pradesh	26,000	26,000
Bihar	6,000	6,500
Uttarakhand, Madhya Pradesh & others	5,000	4,500
Source – Market Estimates		

c. Major changes in the polices governing trade in the spot markets of the commodity

There was no major change in governing policy for trade in Mentha oil in the country.

d. Geo political issues in the commodity and its impact on Indian scenario.

Production of Synthetic Mentha has become a challenge for domestic Mentha industry. However demand of synthetic Mentha is highly elastic and depends upon price of natural Mentha. Economics for synthetic menthol can only work if the price difference between natural and synthetic menthol remain attractive. Synthetic menthol is already at lower cost benefit.

2. Trading related parameter

a. Monthly and Annual traded volume

Month	Traded Quantity (MT)
Apr'19	6078.24
May'19	6196.32
Jun'19	8913.60
Jul'19	14280.84
Aug'19	9585.36
Sep'19	7842.96
Oct'19	6969.24
Nov'19	6909.84
Dec'19	4664.52
Jan'20	3942.36
Feb'20	4162.32
Mar'20	2909.88
2019-20	82455.48

b. Annual traded volume as proportion of total deliverable supply

	Annual traded volume (MT)	Deliverable Supply (MT)
2019-20	82455.48	40,000
Annual traded volume as proportion of deliverable supply	206.14%	

c. Annual traded volume as proportion of total annual production

	Annual traded volume (MT)	Production (MT)
2019-20	82455.48	37,000
Annual traded volume as proportion of production	222.85%	

d. Annual average Open interest as proportion of total production

	Annual daily average OI (MT)	Production (MT)
2019-20	382.93	37,000
Annual daily average OI as proportion of production	1.03%	

e. Annual average Open interest as proportion of total deliverable supply

	Annual daily average OI (MT)	Deliverable Supply (MT)
2019-20	382.93	40,000
Annual daily average OI as proportion of deliverable supply	0.96%	

f. Monthly and Annual value of trade (in Rs. Crores)

Month	Volume (Rs Crs)
Apr'19	886.94
May'19	833.35
Jun'19	1163.38
Jul'19	1794.22
Aug'19	1252.49
Sep'19	999.17
Oct'19	844.97
Nov'19	881.91
Dec'19	606.27
Jan'20	492.75
Feb'20	489.18
Mar'20	333.15
2019-20	10577.78

g. **Monthly and Annual quantity of delivery**

Month	Deliveries (MT)
Apr'19	36.72
May'19	15.12
Jun'19	47.52
Jul'19	34.56
Aug'19	79.92
Sep'19	58.32
Oct'19	95.04
Nov'19	88.56
Dec'19	71.28
Jan'20	54.00
Feb'20	41.04
Mar'20	43.20
2019-20	**665.28**

h. Monthly and Annual value of delivery (in Rs. Crores)

Month	Delivery (Rs Crs)	Value
Apr'19		5.84
May'19		2.16
Jun'19		6.46
Jul'19		4.84
Aug'19		11.47
Sep'19		8.21
Oct'19		12.94
Nov'19		12.36
Dec'19		9.28
Jan'20		6.70
Feb'20		5.15
Mar'20		5.08
2019-20		**90.49**

i. Monthly and Annual Average Open Interest (OI)

Month	Daily Average OI (MT)
Apr'19	392.44
May'19	310.45
Jun'19	313.71
Jul'19	473.12
Aug'19	545.51
Sep'19	567.91
Oct'19	510.10
Nov'19	399.87
Dec'19	311.43
Jan'20	279.31
Feb'20	279.18
Mar'20	238.44
2019-20	**382.93**

j. Annual average volume to open interest ratio

	Daily Average Volume (MT)	Daily Average OI (MT)
2019-20	333.83	382.93
Annual daily average volume to open interest ratio	87.18%	

k. Total number of unique members and clients who have traded during the financial year

2019-20	Unique Members traded	Unique Clients traded
	260	3798

l. **Ratio of open interest by FPOs/farmers/Hedge/VCP positions to total open interest (Annual average as well as maximum daily value)**

Average based weekly data						Maximum Open Interest	
Daily Average Open Interest based on weekly data	Unit	FPOs/ Farmers/ VCPs/ Hedgers		% FPOs/ Farmers/ VCPs/ Hedgers		FPOs/ Farmers/ VCPs/ Hedgers	
		Long	Short	Long	Short	Long	Short
345.36	MT	83.08	95.50	24.05	27.65	182.52	176.76

Note: Details are provided based on weekly disclosure on the Exchange website for the period October 2019 to March 2020 in line with SEBI circular no SEBI/HO/CDMRD/DNPMP/CIR/P/2019/08 Dated January 04, 2019 Based on the data provided by the members from time to time pertaining to Farmers/ FPOs, VCPs/ Hedgers

m. Number of unique FPOs / farmers and VCPs/hedgers who traded in the financial year

Farmers /FPOs	Value Chain Participants (VCPs)
14	43

Based on the classification provided by the members as on March 31, 2020 for clients traded during FY 2019-20.

n. Algorithmic trading as percentage of total trading

Month	Algorithmic trading as a % of total trading
Apr'19	6.59
May'19	7.44
Jun'19	10.47
Jul'19	10.12
Aug'19	9.64
Sep'19	12.17
Oct'19	7.90
Nov'19	7.09
Dec'19	10.21
Jan'20	9.16
Feb'20	5.37
Mar'20	8.04

o. Delivery defaults
   - Number of instances: 1
   - Quantity involved: 0.36 MT
   - Value involved: Rs 0.05 Cr

3. Price Movement:

a. Correlation and ratio of standard deviation of Exchange futures price vis-à-vis international futures price: International futures price is not available for Mentha oil.

b. Correlation and ratio of standard deviation of Exchange futures price vis-à-vis international spot price and domestic spot price (exchange polled price)

Correlation	
	Exchange futures Price
International spot price	NA
Domestic spot price (exchange polled)	0.955

Ratio of standard deviation	
	Exchange futures Price
International spot price	NA
Domestic spot price (exchange polled)	1.442

c. Correlation between exchange futures & domestic spot prices along with ratio of standard deviation.

Correlation	
	Exchange futures Price
Domestic spot price	0.955

Ratio of standard deviation	
	Exchange futures Price
Domestic spot price	1.442

d. Correlation between international futures & international spot prices along with ratio of standard deviation: International futures and international spot prices of Mentha oil are not available.

e. Comparison of Exchange polled price and mandi price:

Correlation	
	Spot 'CP'
Exchange polled price	0.986

f. Maximum & Minimum value of daily futures price volatility and spot price volatility along with disclosure of methodology adopted for computing the volatility.

	Maximum daily volatility	**Minimum daily volatility**
Future price	3.90%	0.01%
Spot price	5.12%	0.00%

(Methodology: %ge change in two consecutive days)

g. Number of times the futures contract was in backwardation/contango by more than 4% for the near month contract in the period under review

	Near month
Next month	37
Spot 'CP'	28

4. Others parameters

a. Qualitative and quantitative measure for Hedge effectiveness ratio and basis Risk (Volatility of Basis) along with disclosure of methodology adopted for such calculations

➢ Qualitative measure for Hedge effectiveness ratio:

Methodology: Critical terms match method has been adopted for the analysis.

Monthly change in 'average last three days price' of futures from its 'average three days price at beginning of the month' compared with corresponding average price of the spot.

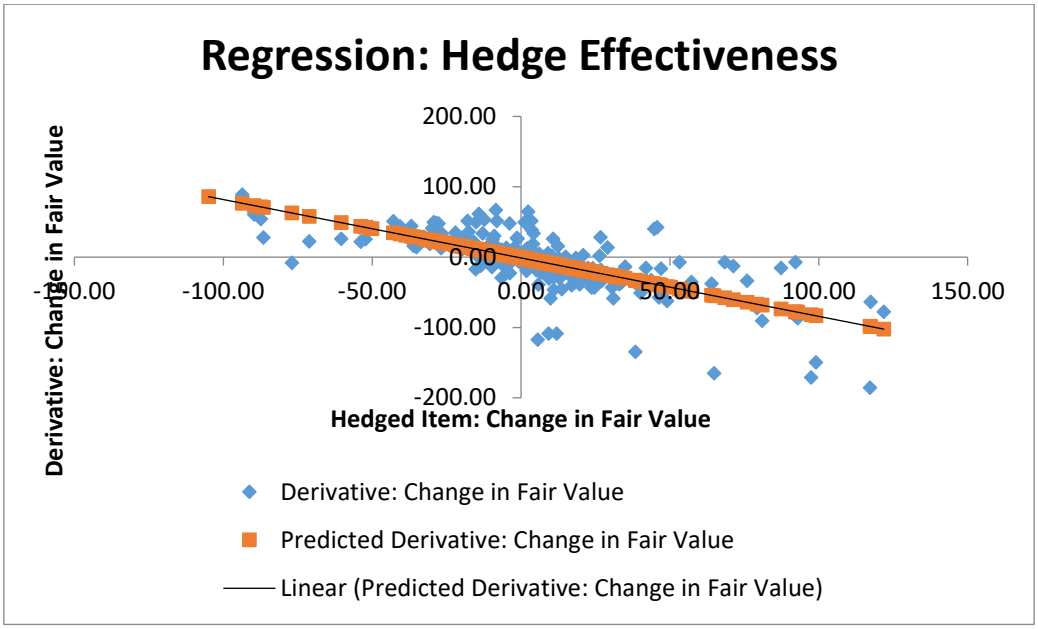
	Mentha Futures	Mentha CP Spot
Apr'19	-194.13	-123.89
May'19	-68.07	-71.65
Jun'19	-79.50	-76.94
Jul'19	47.17	76.35
Aug'19	42.00	26.44
Sep'19	-15.87	-73.99
Oct'19	-5.43	18.84
Nov'19	26.83	-15.33
Dec'19	2.60	4.49
Jan'20	-91.17	-70.88
Feb'20	-8.23	3.76
Average	-31.25	-27.53
Effectiveness		82.35%

➢ Quantitative measure for Hedge effectiveness ratio:

Methodology:

Weekly change in fair value of expected cash flow of hedging instrument (Mentha oil futures) regressed against expected cash flow of hedged item (Mentha oil CP Spot) to determine line of best fit and then goodness fit of the line was assessed i.e. correlation between Mentha oil futures and Mentha oil spot was determined through statistical slope of the line and coefficient of correlation of the regression (R-squared).

Findings:



Regression Statistics	
Multiple R	0.712223
R Square	0.507261
Adjusted R Square	0.505081
Standard Error	28.70011
Observations	228

	Coefficients
Intercept	-1.16334
Hedged Item: Change in Fair Value	-0.83041

Hedge is generally considered to be highly effective if slope parameter is between -0.80 and -1.25, and R-squared parameter is equal to or greater than 0.80.
In cased of Mentha oil futures, though slope parameter falls between -0.80 and -1.25, R-squared is below 0.80. Hence the hedge effectiveness of Mentha oil contract is being concluded as effective.

- Basis Risk (Volatility of Basis)

Methodology:
Basis = Spot price of the underlying – Near month futures price of the underlying
Volatility of basis: Standard deviation of daily basis in comparison of spot

Findings (A):
Average futures price (near month): Rs 1282.59
Average spot price: Rs 1410.45
Average basis: Rs 127.87
Volatility of basis: 1.78%

Findings (B):
Average futures price (near month): Rs 1282.59
Average CP spot price: Rs 1310.38
Average basis: Rs 27.75
Volatility of basis: 1.61%

b. Details about major physical markets of the commodity vis-à-vis market reach in terms of availability of delivery centers (information to be provided state-wise and UT-wise)

- Delivery centers:
  1. Chandausi, Uttar Pradesh
  2. Barabanki, Uttar Pradesh

Chandausi is the basis centre and Barabanki is an additional delivery centre for Mentha oil futures. Barabanki & nearby districts/regions contribute approximately 55% and Chandausi & nearby regions contribute approximately 25% of Mentha oil production in Uttar Pradesh. Mentha oil production share of Uttar Pradesh in the country is approximately 70%.

c. Details about major physical markets of the commodity and average Open Interest for each month generated from those regions:
- Details about major physical markets have already been mentioned above.
- Region-wise open interest is not available.

d. Details, such as number and target audience, of stakeholders' awareness programs carried out by the exchange
- The Exchange conducted awareness programs, staff training programs with members and held several meetings with physical market participants to spread awareness about agriculture contracts.
  In Agri segment, the Exchange conducted more than 80 awareness programs and reached out to more than 20,000 target audience. This includes 18 Mentha oil awareness programs and a participation in a Kisan Mela. Through these programs, the Exchange reached out to approximately 6,500 target audience of Mentha value chain.

e. Steps taken / to be undertaken to improve hedging effectiveness of the contracts as well as to improve the performance of illiquid contracts.
- To make the Mentha oil contract more effective for hedging, the Exchange conducts Product Advisory Committee meetings and also remains in touch with market participants on a regular basis. Based on feedback received, the Exchange makes suitable changes in the contract or other processes, wherever applicable/permissible.

5. **Any other information to be disclosed as deemed important by the exchange or as suggested by the PAC.**

No other information to be disclosed

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