

Market Arrivals and Prices Behavior of Cumin in India

M. D. Meena*, M. K. Vishal and M. A. Khan

ICAR-National Research Centre on Seed Spices Ajmer, Rajasthan, India

*Corresponding author

ABSTRACT

Keywords

Cumin, Arrivals,
Prices, Seasonality,
India

Article Info

Accepted:

08 December 2020

Available Online:

10 January 2021

Present study analyse the market arrivals and price behaviour of cumin in major markets in Rajasthan and Gujrat, using Central Moving Average method from January, 2008 to December, 2019. The markets were choose based on the maximum arrivals in both the states. Study highlights the significant increase in prices of cumin and higher degree of seasonality in arrivals than prices. Throughout study period 44 per cent of annual arrivals sold within three months of harvesting i.e. March, April and May when prices prevails almost five per cent below average. The arrivals were 18.56, 19.65 and 17.99 per cent in the second, third and fourth seasons, respectively when prices were 2.07, 1.49 and 0.92 percent higher than annual average. The correlation between monthly prices and arrivals in the corresponding months was found negative in three (Kekri, Rajkot and Gondal) out of five studied markets, indicates the inverse relationship between prices and arrivals. Jodhpur and Medta city mandis are growing in term of arrivals for cumin seeds.

Introduction

Cumin (*Cuminum cyminum* L.) is an important seed spice widely grown in India, Turkey, Syria Iran, U.A.E. Netherland, U.K. etc. India is the largest producer, consumer and supplier of cumin to world markets. During 2019 with 26 per cent of her production India catered 85 and 90% of the world demand in value and quantity term, respectively (World Bank, 2020). It is the largest grown spice in the country, hovering over more than one fourth to national spice sacreage. In India, it is mainly grown in the states of Rajasthan and Gujarat, having share of 66 and 34 percent in area and 47 and 53 percent in national production respectively

(Spice board India, 2020). Cumin is high value export oriented seed spice, expanding at remarkable growth in area, production and export in last two decades. Higher returns, less input requirement and increasing demand in domestic and international markets signals further expansion (Meena *et al.*, 2018).

Efficient markets are directly governs by prices of agricultural commodities (Chand, 2017). Prices of an agriculture commodity plays a significant influence on the crop acreage (Mesfin, 2000; Mythili, 2001; Mythili, 2008) government policy, consumer's preference, technology adoption (Olga and Stephen, 2009) as well as the marketing decisions of the farmers and other

stakeholders (Saxena *et al.*, 2017). Fluctuations in prices significantly affects the income of farmers (Saxena and Chand, 2017). Understanding of trends and seasonality in prices helps the farmers and all other stakeholders in supply chain in making decisions to mitigate and ironing out price socks through appropriate choice. This information enables farmers to take informed decision as to when and where to sell (Acharya, 2003). Therefore present study is undertaken to help cumin stakeholders in taking decision of right time and place to sale to their produce.

Materials and Methods

This study is purely based on secondary data regarding prices and arrivals of cumin seeds in major APMC markets of Gujarat and Rajasthan states. Markets were chosen on the basis of the quantity of arrivals. In Rajasthan, Jodhpur, Kekri and Merta City wherein Gujarat, Gondal and Rajkot markets were selected. The daily market price and arrival information in above markets were compiled from Agmarknet website from January, 2008 to December, 2019. Information on area, production and export were taken from Spice board of India.

Analysis of data

The compound growth rates of arrivals and prices of selected agricultural commodities was worked out by using an exponential form of equation as below:

$$Y=ab^t$$

Where,

Y = Monthly arrivals/prices
a = Constant
b = Trend co-efficient
t = Time period

Annual compound growth rate (CGR) in percentage is calculated as $CGR (\%) = (\text{Antilog of } b-1) \times 100$

According to multiplicative model, price series can be decomposed into four component i.e. (Price = Trend x Cyclical x Seasonal x Random/Irregular components). Trend is the tendency of a series to upward or downward direction over the period of time. Cyclical phenomenon repeats itself over the period. Seasonal variations are periodic moments which repeats during the period of 12 months regularly every year, have their origin in the nature of year itself. The analysis in this study focused on the seasonal component by removing other components (viz; trend, cyclical and random) from price series. To estimate the seasonal price index of a time series, central moving average (CMA) is estimated using the following formula

$$CMA_t = \sum \frac{p_i}{n}$$

$$i = t-1/2(n-1)$$

Where: CMA = Central Moving Average, P_i = Nominal price, n = number of periods

Central moving average for any given number of periods substitute the observed value in the time series by the average of that value. Consequently, the CMA eliminates random variations and emphasizes systematic movements of variables series. CMA has the same trend as the price, show cyclical fluctuations appearing in the original series. The CMA represents the trend and cyclical components of the original series and eliminates seasonality and randomness.

Seasonality is expressed as 12 indexes that represent the ratio of the price each month to the average annual price. Seasonal index (SI) can then be written as:

$$SI = TCSE_i / TC_i = SE_i = (P_i / CMA_i) * 100$$

SI includes seasonal fluctuation in addition to randomness (E). The SI is already deflated as it is calculated by dividing nominal price series (the original price) by another nominal series.

To remove the effect of irregular movement from the SI values, the averaging of SI for each month over the different years is used, then adjusting SI figure series by the adjustment factor,

$$\text{Adjustment factor} = 1200 / \sum_{i=12}^{12} SI$$

Grand seasonal index (GSI) was calculated by obtaining the average seasonal index for each month of a given year and then adjusting this series in such a way that it adds up to 1200 specifically:

$$GSI = SI * 1200 / \sum_{i=12}^{12} SI$$

SI= is the average seasonal index for month i

GSI is an average of the seasonal indices that removes all irregular movements of the time series. It represents the pure seasonal average of the series during the period under analysis (Makama, 2016).

Results and Discussion

Area, production and export of cum in during study period

Cumin is the largest grown spice in India occupying 10.27 lakh ha out of 39.27 lakh ha total spice and 17.74 lakh ha seed spice acreage during 2018-19. During study period, from 2008-09 to 2018-19 cumin cultivation has expanded to more than double and production increases 2.3 times at compound growth of 7.25 and 8.32 percent, respectively (Table 1). Cumin cultivation is mainly taken in

Gujarat and Rajasthan. Throughout the study period, both the states jointly contribute more than 95 and 93 percent share to national area and production, respectively. From 2008-09 to 2018-19, cumin cultivation in Rajasthan increased at a faster rate than Gujarat. Rajasthan's share to national total enhanced from 45 to 66 percent in area and from 25 to 47 percent in production from 2008-09 to 2018-19. Additional area of 4.61 lakh ha coupled with yield enhancement of 116 kg ha⁻¹ resulted in 2.2 lakh tonnes additional cumin seeds in the state. Mainly in Jodhpur, Jaisalmer, Badmer, Jalore, Pali and Nagour districts of Rajasthan its cultivation expanded. In Gujarat also its cultivation increased by 0.88 lakh ha mostly in the northern district of the state i.e. Mehsana, Banaskantha and Patan district.

India is the top exporter of cumin in the world, contributing 85 percent (\$474M) of world (\$555M) cumin trade in 2019. The other top exporters of cumin seeds are Turkey (\$25.4M), European Union (\$6.7M), Netherland (\$6.3M) and Spain (\$5.7M). Whereas top importers are USA, European Union, Egypt, UK and Turkey (World Bank, 2020). During study period export of cumin from India has increased at double rate (16.11%) than production (8.32%). Export to production share increased from 20 to 30 per cent to nation's total production indicates increasing demand for Indian cumin. India was exporting 52 thousand tonnes in 2008-09 has touched 1.8 lakh tonnes in 2018-19 shows tremendous scope.

Trend in prices and arrivals of cumin in study markets

The daily market prices were averaged to monthly price and analysed. During study period, cumin seed prices vary between 7221 to 19155 Rs qtl⁻¹. Whereas arrivals in

these markets varies from nil or zero arrivals to 22414 tonnes in a month. Among selected markets, maximum monthly arrivals and price was recorded in Merta City. The coefficient of variation (CV) in monthly prices was measure between 17 and 21 percent against 91 to 245 per cent in arrivals due to more arrivals in few months against no arrivals in many months. From the table 2 it can be seen that there was nil arrivals in Rajasthan markets for few months wherein Gujarat markets there was regular supply in each

month indicates higher produce holding capacity of Gujarat farmers. Positive kurtosis value indicates higher peaks in arrival against negative kurtosis value for prices shows light tailed price sets. Skewness measures the symmetry of distribution shows that prices were more symmetrical whereas arrivals were highly positively skewed. Distribution of price was normal compared to arrivals. Gujarat markets were more uniform compared to Rajasthan market.

Table.1 Area (000 ha), Production (000 tonnes) and export (000 tonnes) of cumin

Year	India			Rajasthan		Gujarat	
	Area	Production	Export	Area	Production	Area	Production
2008-09	477.94	264.86	52.55	215 (45)	66 (25)	262 (55)	198 (75)
2009-10	527.13	283.00	49.75	216 (41)	95 (34)	273 (52)	140 (49)
2010-11	625.00	404.00	32.5	202 (32)	101 (25)	306 (49)	168 (42)
2011-12	594.00	394.00	45.5	200 (34)	111 (28)	307 (52)	189 (48)
2012-13	593.98	394.33	85.60	220 (37)	111 (28)	374 (63)	283 (72)
2013-14	690.08	445.03	121.5	320 (46)	165 (37)	370 (54)	280 (63)
2014-15	701.56	372.29	155.5	435 (62)	121 (32)	267 (38)	251 (68)
2015-16	808.23	503.26	97.79	511 (63)	201 (40)	295 (37)	301 (60)
2016-17	780.92	500.36	119	500 (64)	207 (41)	279 (36)	292 (58)
2017-18	966.17	689.42	143.67	581 (60)	303 (44)	383 (40)	384 (56)
2018-19	1027.84	607.97	180.3	676 (66)	286 (47)	350 (34)	320 (53)
CGR (%)	7.25	8.32	16.11	14.56	14.99	1.92	8.42

Source: Spice board of India

Note: Figure in parenthesis indicates the percent share to national area and production

Table.2 Descriptive statistics of monthly cumin prices (Rsqt⁻¹) and arrivals (Tonnes): 2008 to 2019

Particulars	Jodhpur		Kekri		Merta City		Gondal		Rajkot	
	P	A	P	A	P	A	P	A	P	A
Mean	12611	461	11855	288	12975	1203	12858	2010	12773	1449
Standard Error	182.11	70.01	186.40	55.74	227.36	245.79	212.48	235.46	214.23	110.41
Median	12641	119	11768	35	12229	225	12520	1013	12635	971
St. Deviation	2185	840	2237	669	2728	2949	2550	2825	2571	1325
Kurtosis	-0.92	11.71	-0.50	27.52	-0.91	27.06	-0.81	8.28	-0.98	3.52
Skewness	0.12	3.18	0.24	4.49	0.31	4.81	0.10	2.89	0.14	1.88
Minimum	8321	0	7625	0	7221	0	7847	63	8121	11
Maximum	17301	5160	17026	5536	19156	22414	19139	14436	18040	6623
C.V. (%)	17.27	182.19	18.80	232.57	20.95	245.10	19.76	140.57	20.06	91.45

Table.3 Annual average prices (Rsqt^l1) and total arrivals (tonnes) of cumin in study markets

Year	Jodhpur		Kekri		Merta City		Gondal		Rajkot	
	Price	Arrival	Price	Arrival	Price	Arrival	Price	Arrival	Price	Arrival
2008	9504	690	9051	541	9054	356	9309	9207	9399	18809
2009	10485	110	9847	227	10407	660	10121	64171	9795	20343
2010	11237	48	10684	140	11515	1741	11265	13005	11367	15927
2011	12762	114	11745	2563	12394	3216	12563	10316	12455	12633
2012	12729	2094	11905	3100	12107	1837	12724	14557	12407	17557
2013	11540	5751	11226	2735	11544	64873	11842	24073	11606	18107
2014	9821	6550	8693	10536	10131	18219	9811	32354	9722	23248
2015	13345	6305	12163	15527	14010	14995	14203	12824	13901	13723
2016	14337	9181	13462	1398	15344	13723	15347	9952	15041	13635
2017	15802	8954	14766	211	17013	5342	16761	15818	16591	16337
2018	15225	12593	14606	1759	16555	21076	15683	15608	16017	20045
2019	14540	14013	14115	2681	15630	27246	14661	67563	14976	18280
CGR(%)	3.91	61.88	3.99	15.86	5.12	41.37	4.60	3.67	4.76	-0.13

Table.4 Trend in total annual arrivals and average annual prices of cumin in study market and Correlation in monthly arrivals and prices during 2008 to 2019

Market	Arrival		Price		Correlation
	Trend equation	R ²	Trend equation	R ²	
Jodhpur	-3103.10+1328.71****(t)	0.96	9440.97+490.19***(t)	0.83	0.26
Kekri	1699.47+296.55 (t)	0.21	8742.83+484.09***(t)	0.82	-0.16
Merta City	1938.25+1923.40(t)	0.38	8756.46+649.82***(t)	0.88	0.05
Gondal	18988.62+789.55(t)	0.14	9104.61+579.86***(t)	0.84	-0.34
Rajkot	17545.86-24.45(t)	0.03	8882.72+601.60***(t)	0.86	-0.21

Note: *** indicates significant at 1percent level of significance

Fig.1 Seasonal Index for cumin prices

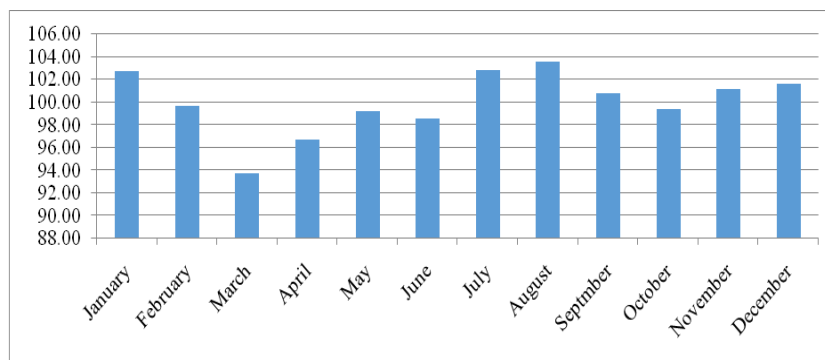


Table.5 Season-wise arrivals and price prevailed of cumin in study markets

Year	Particulars	Season I March to May	Season II June to Aug.	Season III Sept. to Nov.	Season IV Dec. to Feb.	Annual
2008	Arrival	13320.3 (45)	7786.4(26)	3933(13)	4563.85(15)	29603.55
	Price	8535 (-7.86)	10246 (10.61)	9312 (0.52)	8961 (-3.27)	9264
2009	Arrival	13654.1(16)	23046.79(27)	36279.1(42)	12530.4(15)	85510.39
	Price	9873 (-2.54)	9881 (-2.46)	10535 (3.99)	10234 (1.02)	10131
2010	Arrival	13020.91(42)	5567.4(18)	3068.3(10)	9204.13(30)	30860.74
	Price	10407 (-7.20)	11717 (4.49)	11551(3.01)	11180 (-0.30)	11214
2011	Arrival	11057(38)	4890.6(17)	5831.47(20)	7063.1(24)	28842.17
	Price	12506 (0.98)	12228 (-1.26)	12126 (-2.08)	12676 (2.36)	12384
2012	Arrival	21245.93(54)	7393.2(19)	2353(6)	8153.1(21)	39145.23
	Price	11362 (-8.19)	12802 (3.46)	12708 (2.70)	12626 (2.03)	12375
2013	Arrival	36119.61(31)	44597.3(39)	16125.2(14)	18696.31(16)	115538.4
	Price	11401 (-1.30)	11748 (1.70)	11342 (-1.82)	11715 (1.42)	11552
2014	Arrival	41171.6(45)	22239.7(24)	12146.56(13)	15348.62(17)	90906.48
	Price	9003 (-6.56)	9501 (-1.40)	9237 (-4.14)	10801 (12.10)	9636
2015	Arrival	33835.5(53)	8002.1(13)	5825.5(9)	16091.7(25)	63372.9
	Price	13518 (-0.05)	13875 (2.59)	13627 (0.76)	13123 (-2.97)	13524
2016	Arrival	30796.3(64)	9001.1(19)	2065.9(4)	6026.9(13)	47890.2
	Price	13982 (-4.93)	15680 (6.62)	15578 (5.93)	13585 (-7.63)	14706
2017	Arrival	22604.51(48)	7441.8(16)	7206.2(15)	9409.31(20)	46661.82
	Price	15727 (-2.84)	15964 (-1.38)	16324 (0.84)	16733 (3.37)	16187
2018	Arrival	39516(56)	12867.5(18)	5816.1(8)	12881.9(18)	71081.5
	Price	13645 (-12.63)	15509 (-0.69)	17057 (9.22)	16258 (4.10)	15617
2019	Arrival	56090(43)	19132.4(15)	45199(35)	9361.6(7)	129783
	Price	14683 (-0.69)	15351 (3.84)	14236 (-3.71)	14867 (0.56)	14784
Overall	Arrival	26274 (43.86)	11116 (18.56)	11769 (19.65)	10778 (17.99)	59905
	Price	12053 (-4.45)	12875 (2.07)	12803(1.49)	12730 (0.92)	12614

Note: Figure in parenthesis indicates percent to annual arrivals and change over annual price

Fig.2 Seasonal Index for cumin arrivals

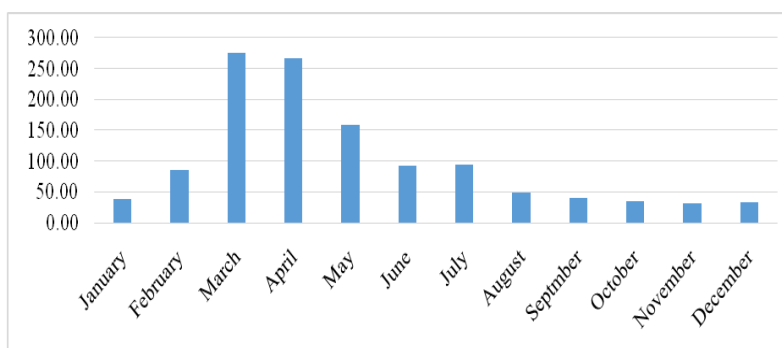


Table.6 Seasonality index in cumin price and arrivals in study markets

Month	Jodhpur		Kekri		Merta City		Gondal		Rajkot	
	Price	Arr.	Price	Arr.	Price	Arr.	Price	Arr.	Price	Arr.
January	102.38	14.56	103.13	19.30	100.83	13.69	102.30	81.20	104.96	65.23
February	100.58	9.78	97.17	44.78	96.82	8.65	102.36	160.45	101.42	201.33
March	92.89	104.03	93.03	527.31	96.43	165.66	92.55	242.69	94.05	335.14
April	95.80	425.84	96.15	271.69	96.03	342.43	98.35	138.28	97.34	158.90
May	98.89	242.40	98.38	101.06	101.65	249.38	98.79	109.10	98.25	94.48
June	98.17	123.78	99.11	54.49	100.44	161.41	96.92	68.60	98.10	56.60
July	102.05	122.63	103.97	92.45	103.33	97.34	103.16	104.64	101.66	53.29
August	102.96	45.45	106.47	26.82	103.48	53.76	100.47	64.44	104.39	50.78
September	100.62	34.94	102.97	23.23	100.79	34.09	100.95	59.75	98.52	51.98
October	99.89	37.46	99.62	11.50	99.28	29.51	99.05	54.79	99.14	38.98
November	103.10	17.87	99.51	6.70	98.69	24.69	102.83	62.61	101.84	43.75
December	102.67	21.25	100.48	20.66	102.23	19.40	102.27	53.46	100.34	49.53
Maximum	103.10	425.84	106.47	527.31	103.48	342.43	103.16	242.69	104.96	335.14
Minimum	92.89	9.78	93.03	6.70	96.03	8.65	92.55	53.46	94.05	38.98
C.V. (%)	10.42	191.02	13.48	194.98	7.47	190.14	10.85	127.80	10.96	158.32

From 2008 and 2019 cumin seed prices increased by more than fifty percent at compound growth rate of 4 to 5 percent. Arrivals have registered higher compound growth in Rajasthan mandis than Gujarat because production in the former state has increased at higher rate and traders from major Gujarat markets are expanding their business activities in Rajasthan markets. Highest growth in annual arrivals is measured in Jodhpur (62%) followed by Merta city (41%) shows both these mandis are budding in big way for cumin seed. Highest increase in average annual prices was also recorded Merta City among study markets. Cumin arrivals in Rajkot market does not shown major changes throughout study years (Table 3).

To measure the trend in annual price and arrivals liner regression was fitted (Table 4). Among all study markets only Jodhpur market shown significant increase in quantity

of arrivals with an annual increase of 1329 tons per year. Other markets couldn't establish significant relationship in arrivals. Cumin seed prices in all the study market shown significant increase with more than 82 percent coefficient of determination (R^2). Highest per year price increase is seen in Merta City with an annual increase of 650 Rsqt^{-1} followed by Rajkot and Gondal Market with 602 and 580 Rsqt^{-1} increase respectively.

To study relationship between cumin price and its arrivals in a particular market correlation coefficient between two was checked. Three out of five studied markets namely Kekri, Gondal and Rajkot shows inverse relationship between both. Wherein, Jodhpur and Merta city arrivals could not adversely affected the price received by farmers, may be the reason for higher growth in arrivals over the years in both the markets. This is welcome feature for the cumin

growing farmers in Rajasthan shows the quality demand for produce from those areas (Virendra *et al.*, 2005). Similar inverse effects of arrivals in price were also found in coriander seed (Meena *et al.*, 2020).

Seasonality in Price and arrivals of cumin seeds

Due to seasonality in production, arrivals of agricultural commodities are not uniform throughout the year. It is more in the peak season of production and lesser in lean season of the year. Prices also changes from season to season and within the season from month to month. In general prices are at the lowest when arrivals are at the peak and gradually increases with the decrease of arrivals till the end of the crop season. Because the price elasticity of demand for agricultural commodities in general is less than unity in most cases (Rao, 1985). Therefore pattern of arrivals and prices in cumin is examined to minimize loss to the cumin growers due to such fluctuations. Cumin crop is generally sown from mid-October to mid- November and harvested in late February to mid-March. New produce arrives in markets in March onward. It can be observed from the table 5 that throughout study period forty four percent of the total arrivals (up to 64% in 2016) sold in first season i.e. during March, April and May months. It was observed that throughout study period average prices in this season measured five percent (up to 13% less in 2018) below annual average. In next three seasons arrivals varied between 18 to 20 percent to annual arrivals when prices prevailed one to two percent higher than annual average. Similar study was conducted by Verma and Verma (2013) in Jodhpur market during 2005-06 to 2010-11. They found 64 percent cumin arrivals in first season and prices were found 10 percent less than annual average against 44 percent arrivals and 5 percent below than normal in first season in current study

indicates that farmers have spread their sale over the period and are getting comparatively better prices. They also found negative correlation in price and arrivals in Jodhpur market (-0.58) against positive correlation in present study indicates the increased marketing efficiency in Jodhpur market is welcome marketing behaviour.

Further month-wise detailed analysis of seasonality in arrivals and prices, market-wise seasonality index was measured. The results presented in table 6 and figure 1 and 2, clearly depicts the seasonality in cumin arrivals and prices in the selected markets. The SI of prices ranged from 92.55 per cent in during March (in Gondal, Gujarat) to 106.47 in August (in Kekri, Rajasthan). Mean that prices in March months were 15 percent lower than August months. During March prices are 7 to 8 percent less than the annual average due to maximum arrivals (277%) whereas 6 to 7 percent higher prices than the annual average in August due to lower arrivals (48%). Prices in six month namely, February, March, April, May, June and October were lower than annual average prices. Arrivals in March, April and May were more than annual average. Seasonality index for prices in March, April and May was measured 94, 97 and 99 when seasonality index for arrivals was 275, 267 and 159 respectively.

Average seasonal index for arrivals was measured highest in March (275%) and lowest in November (32.12%) means arrivals in peak month was 856% more than lean month. There was high degree of variation in arrivals (CV=159%) compared to variation in prices (9.9%) indicates more fluctuations in arrivals than price.

In summary during 2008 to 2019, cumin cultivation has expanded in the country, as of coupled effect of its area and yield

enhancement. It has increased at faster pace in Rajasthan. There is significant increase in its prices over the study period. There exists a higher degree of seasonality in cumin arrivals in the markets. Farmers are selling 44 percent of total their production in first three month of harvest. Cumin prices in peak arrival month was found at its lowest level. There was negative correlation in arrivals and prices in Kekri (Rajasthan) and Gondal and Rajkot (Gujarat). Jodhpur and Merta City APMC's in Rajasthan are coming in big way will help in increased market efficiency in cumin.

References

Chand R 2017 Doubling farmers' income: rationale, strategy, prospects and action plan. NITI Aayog, New Delhi.

Gupta, S P 2012 Statistical methods. Sultan Chand & Sons, New Delhi:628-634.

<https://oec.world> accessed on 26 June, 2020.

Meena M D, Lal G, Meena S S and Meena NK 2018. Production and export performances of major seed spices in India during pre and post- WTO period. *International Journal of Seed Spice*. pp. 21-30.

Meena M D, Lal,G and Meena,S.S. 2020 Market arrivals and pricebehaviour of coriander seeds inRajasthan, India. *International J. Seed Spices* 10(1):27-38.

Mesfin A 2000 Supply response of maize in Karnataka state-an econometric analysis. Ph. D. Thesis, University of Agricultural Sciences, Dharwad.

Mythili G 2001. A note on acreage response

for major crops in the selected states. In:Kalirajan, KP.,Mythili, G., and Sankar, U. (Eds.) *Accelerating growth through globalisation of Indian agriculture*. Macmillan India Ltd.

Mythili G 2008 Acreage and yield response for major crops in the pre-and post-reform periods in India: a dynamic panel data approach. Policy paper, 61, IGIDR, Mumbai.

Olga I M and Stephen M 2009 U.S. Cotton Prices and the World Cotton Market: Forecasting and Structural Change. Economic Research Report Number 80. Available at

Rao KV 1985 Marketing Efficiency in Agricultural Products - A Case Study of Cotton in Guntur District in Andhra Pradesh. Himalaya Publishing House, Bombay: 14-17.

Saxena R and Chand R 2017. Understanding the recurring onion price shocks: revelations from production-trade-price linkages. Policy paper 33, National Institute of Agricultural Economics and Policy.

Verma, V K, Kumar, P and Verma, BL 2013. Market arrivals and price behaviour of cumin in Mandor market of Jodhpur district of Rajasthan. *Internat. J. Com. & Bus. Manage*, 6(2): 352-356.

Virender, K Sharma, H.R. and Singh, K. 2005. Behaviour of market arrivals and prices of selected vegetable crop: A study of four metropolitan markets. *Agric. Econ. Res. Rev.*, 80: 271-290.

How to cite this article:

Meena, M. D., M. K. Vishal and Khan, M. A. 2021. Market Arrivals and Prices Behavior of Cumin in India. *Int.J.Curr.Microbiol.App.Sci*. 10(01): 528-536.
doi: <https://doi.org/10.20546/ijcmas.2021.1001.064>