MINISTRY OF NATIONAL FOOD SECURITY AND RESEARCH

SUPARCO

PAK-SCMS BULLETIN

PAKISTAN: SATELLITE BASED CROP MONITORING SYSTEM

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SUPARCO, the National Space Agency of Pakistan, started the program on "Monitoring of Crops through Satellite Technology" during the year 2005. This is a perpetual study encompassing all growing seasons around the year. The purpose of this initiative is to reinforce support for policy makers, planners and private sector for food security, stocking, marketing, trade and industrial management. The final crop estimates are released by end of March for Rabi crops and mid of October for Kharif crops.

Food and Agriculture Organization of United Nations, (FAO-UN) provided technical backstopping for analytics and transfer of technology.
Wheat, cotton, rice, sugarcane, maize and potato crops are being covered under this program. In addition, large scale geospatial applications of satellite remote sensing technology have been made for monitoring/mitigation of natural disasters (floods, flash floods, and drought) and providing reconnaissance detailed information ordained for the uplift of agriculture and allied pursuits.

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CROP SITUATION: MARCH 2022

Summary

By the end of March 2022, decreasing values of Satellite based Normalized Difference Vegetation Index (NDVI) depicted maturity / senescence of rabi crops. Generally, above normal day and night temperatures were observed in most parts of the country. Heat wave was observed over agricultural plains during mid of March 2022. 3-4 wide spread rain spells with below normal rains were received in Punjab, Khyber Pakhtunkhwa, Gilgit-Baltistan and Azad Jammu & Kashmir. 2 rain spells with light rains were observed at scattered places in Sindh and Balochistan.

This year, wheat crop scenario was not promising at the start of season due to anticipated inputs availability and forecasted agro metrological conditions. SUPARCO using its Satellite based Crop Monitoring System, estimated wheat production of 26.129 million tons from an area of 9.387 million hectares with yield of 2784 kg per hectare for rabi season 2021-22. The estimated production is less than the fixed target of 28.885 million tons mainly due to decrease in area and yield. Wheat yield was affected by urea and short irrigation water supply, increase in rust prevalence and high temperatures in the last fortnight of March (heat wave). Government is planning to procure 6 million tons of wheat @ price of Rs. 2200 per 40kg through PASSCO and provincial food departments. In the light of wheat production during last year, it will be difficult to achieve this procurement target.

Pakistan Cotton Ginners Association Final report of 1st March, 2022, showed arrival of 7.44 million bales in the ginneries up by 32 percent from last year. This production is however, much less than the target and country requirement of cotton bales to meet textile industry demand. Higher cotton prices during March in the international and national markets will mobiliz farmers to grow more cotton. Increase in cotton area is therefore expected in coming kharif season.

Most of sugar mills in the country closed their mill operations by end of March. This year, sugar production in the country was higher than last year to meet country

sugar requirements. This high sugar production resulted in decrease of sugar price in the local market. In local markets, sugar price during March 2022 decreased by 11.92 percent as compared to March 2021 in spite of 18.4 percent increase in sugar price in international market.

As per report of Indus River System Authority (IRSA) for March 2022, the irrigation water supply was 4.54 MAF against the last year's supply of 4.51 MAF, showing a nominal increase of 0.78 percent. As compared to the same period of last year, the irrigation water supplies were however, decreased in Punjab (lower by 0.90 percent) and Balochistan (lower by 5.11 percent). Sindh and Khyber Pakhtunkhwa have increased irrigation water supplies of 3.22 and 13.85 percent respectively, during March, 2022 as compared to March, 2021.

As per report of National Fertilizer Development Centre (NFDC), total availability of Urea in February, 2022 was 537 thousand tons whereas total availability of DAP was 314 thousand tons. During February 2022, offtake of Nitrogen was increased by 18.1 percent as compared to the same period of last year. Phosphate and Potash offtake, however, was decreased by 29.1 and 30.9 percent respectively, as compared to the same period of last year.

Normalized Difference Vegetation Index (NDVI) 31st March 2022

Rabi 2021-22

Wheat Crop 2021-22

MNFS&R, in its meeting of Federal Committee on Agriculture (FCA) held during October, 2021 had fixed wheat production target of 28.885 million tons from an area of 9.210 million hectares to meet wheat requirement of the country. Province-wise wheat targets fixed by FCA were as follows;

FCA Targets 2021-22			
Province	**Area (000 ha)**	**Production (000 Tons)**	**Yield (kg/ha)**
Punjab	6,560	21,945	3,345.3
Sindh	1,200	4,200	3,500.0
Khyber Pakhtunkhwa	900	1,525	1,694.4
Balochistan	550	1,215	2,209.1
Total	**9,210**	**28,885**	**3136.3**

Source: FCA

Using Satellite based Crop Monitoring System, SUPARCO estimated wheat production of 26.129 million tons from an area of 9.387 million hectares for rabi season 2021-22. Province wise SUPARCO estimates for wheat crop are as follows;

Satellite based Wheat Estimates 2021-22			
Province	**Area (000 ha)**	**Production (000 Tons)**	**Yield (kg/ha)**
Punjab	6,413.2	19,040.8	2,969.0
Sindh	1,780.5	4,745.0	2,665.0
Khyber Pakhtunkhwa	748	1,369.4	1,829.0
Balochistan	444.8	974.1	2,190.0
Total	**9387.2**	**26,129.3**	**2,784.0**

Key Factors for Wheat Crop 2021-22

Positive Factors

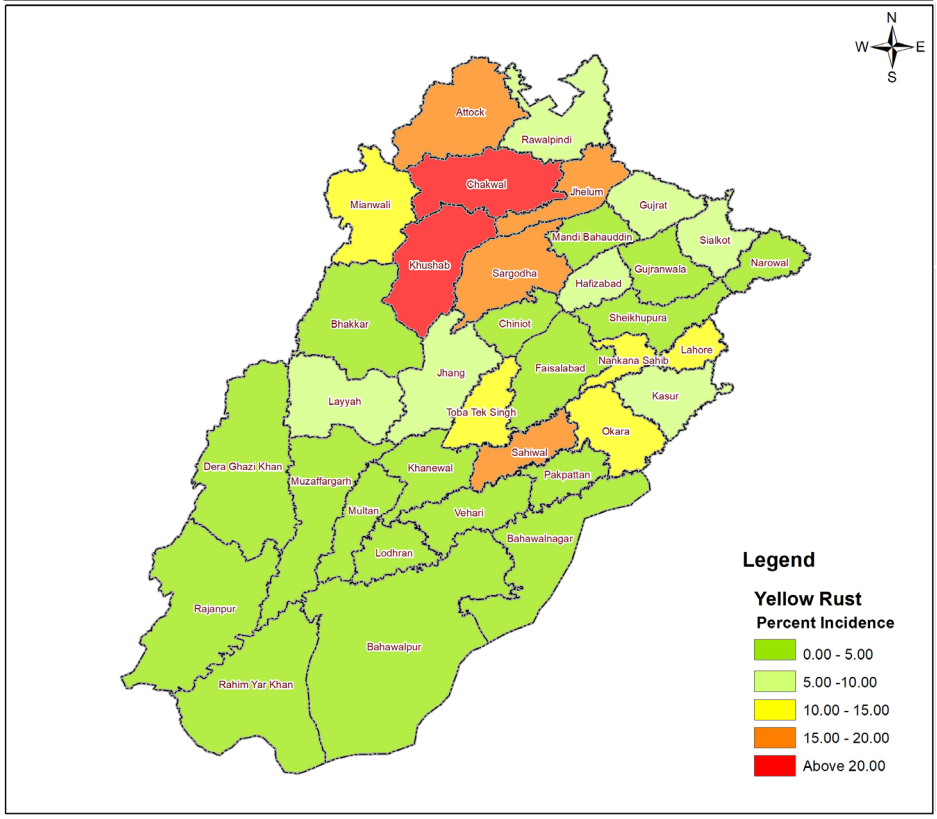
1. Rains and cool weather during January and February played vital role to minimize impacts of fertilizer and irrigation water supplies shortage.
2. High potash offtake and application helped to enhance water preservation, balance of water and drought, improved nutrients offtake from soil particularly of nitrogen and resistance to lodging and disease.

Negative Factors

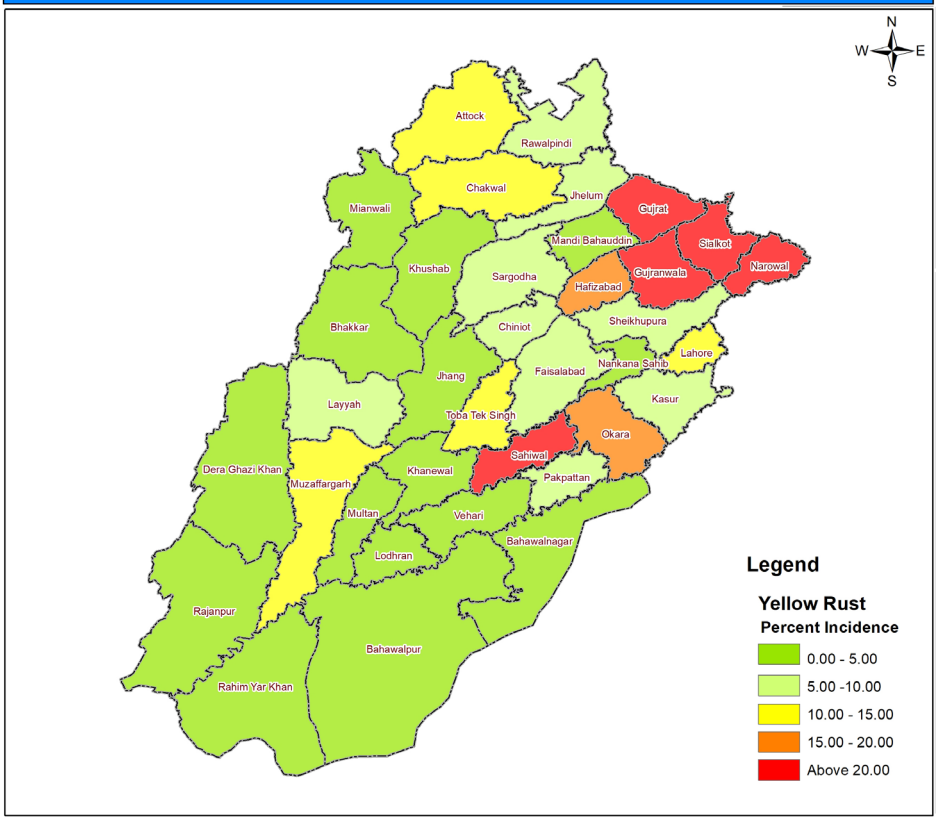
1. Fertilizers offtake during rabi season (Oct - Feb) in terms of nitrogen and phosphate was less than last rabi seaon (Oct-Feb) by 2.9 and 7.9 percent respectively.
2. Higher fertilizer prices may affect field application as per crop requirement. Urea price was fifteen percent higher than last year. Similarly during the season, average DAP price was double than the price of last year.
3. Shortage of urea during the season further increased urea availability price to farming community.
4. Water Reservoirs of Tarbela and Mangla had water storage less by 34 and 44 percent respectively as compared to last year as on 28th September (Start of Season) indicating short irrigation supplies during crop growth.
5. Irrigation water supplies during this Rabi season (Oct to March 2022) were lower than last year.
6. Overall, during the season (Oct-Mar) country faced irrigation water supplies of 6.13 percent from last year. Punjab, Sindh and Balochistan had irrigation water supplies shortage of 7.99, 5.11 and 7.02 percent during the season (Oct-Mar) as compared to same period of last year. Khyber Pakhtunkhwa province however, have 15.68 percent higher irrigation water supplies.

7. High temperatures (minimum and maximum) during last fortnight of March affected wheat production due to grain shrinkage.
8. High prevalence of rust particularly during the month of February as compared to last year.

Punjab: Yellow Rust Incidence up-to 3rd week of March, 2021



Punjab: Yellow Rust Incidence up-to 3rd week of March, 2022



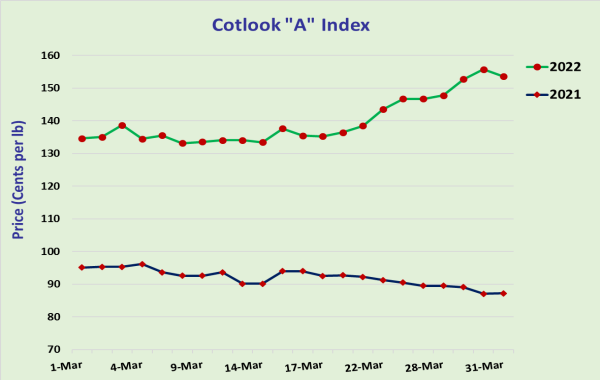
Kharif Crops 2021-22

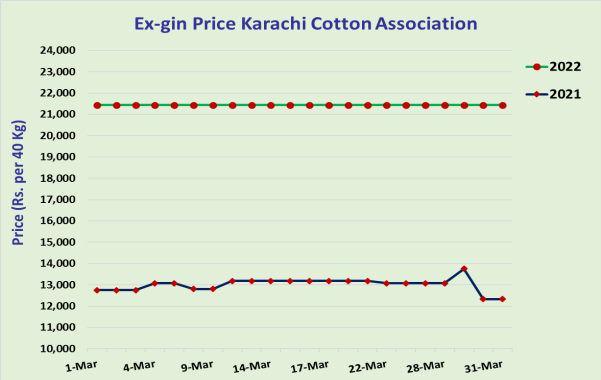
Cotton Crop 2021-22

This year, phutti prices remained very attractive showing an increase of around 40 to 50% from last year. High net profitability may attract farmers' attention to grow more cotton with better husbandry measures during coming cotton season.

In the international market, average cotton price for March 2022 was 139.85 cents per lb as compared to average cotton price of 92.02 cents per lb for March 2021 showing an increase of 47.84 cents per lb. This shows an increase of 34 percent in cotton price from the last year.

In local markets, average cotton price for March 2022 was Rs. 21434 per 40 Kg as compared to average cotton price of Rs 13007.6 per 40 Kg for March 2021. This showed an average increase of Rs. 8426.4 per 40 Kg (39.3 percent) from last year. Graphs showing Cotlook "A" index price and ex-gin price of Karachi cotton association is given below;





Source: PCCC

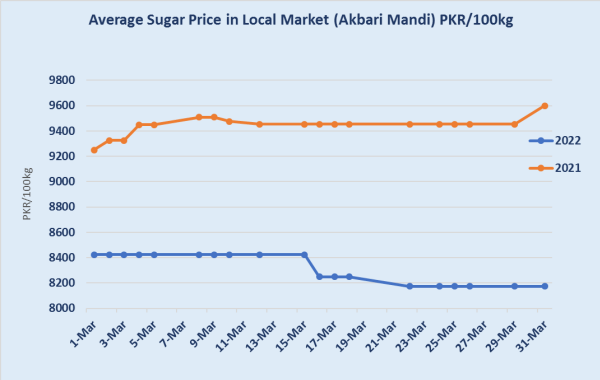
Sugarcane Crop 2021-22

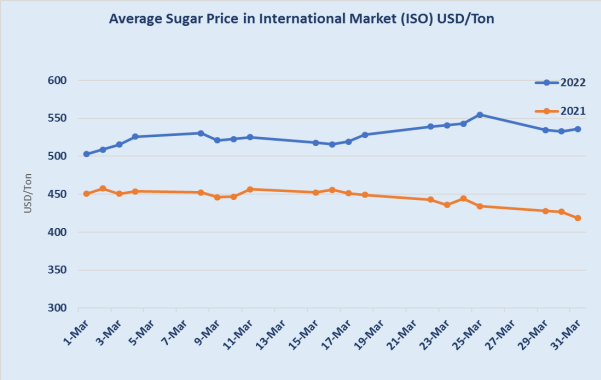
Most of sugar mills in the country complete their mill operations by the end of March. This year, sugar production in the country was higher than last year to meet country sugar requirements. No hue and cry relevant to sugarcane procurement and market prices were observed in the farming community.

Sugar price in the international market during March 2022 was approximately 18.4 percent higher compared to March 2021. Average sugar price during March 2022 was USD 527.04 per ton against the average sugar price of USD 444.95 per ton during March 2021, showing average increase of USD 82.09 per ton.

Sugar prices in the local market however decreased during March 2022 as compared to March 2021. Average sugar price during March was around Rs. 8318.42 per 100 kg as against the average sugar price of Rs. 9444.47 per 100 kg showing decrease of around Rs. 1126.05 per 40 kg (approx. 11.92 percent lower).

Graphs showing daily white sugar price index in the International market (International Sugar Organization) and daily aver¬age sugar price in the local market (Akbari Mandi) are given below;

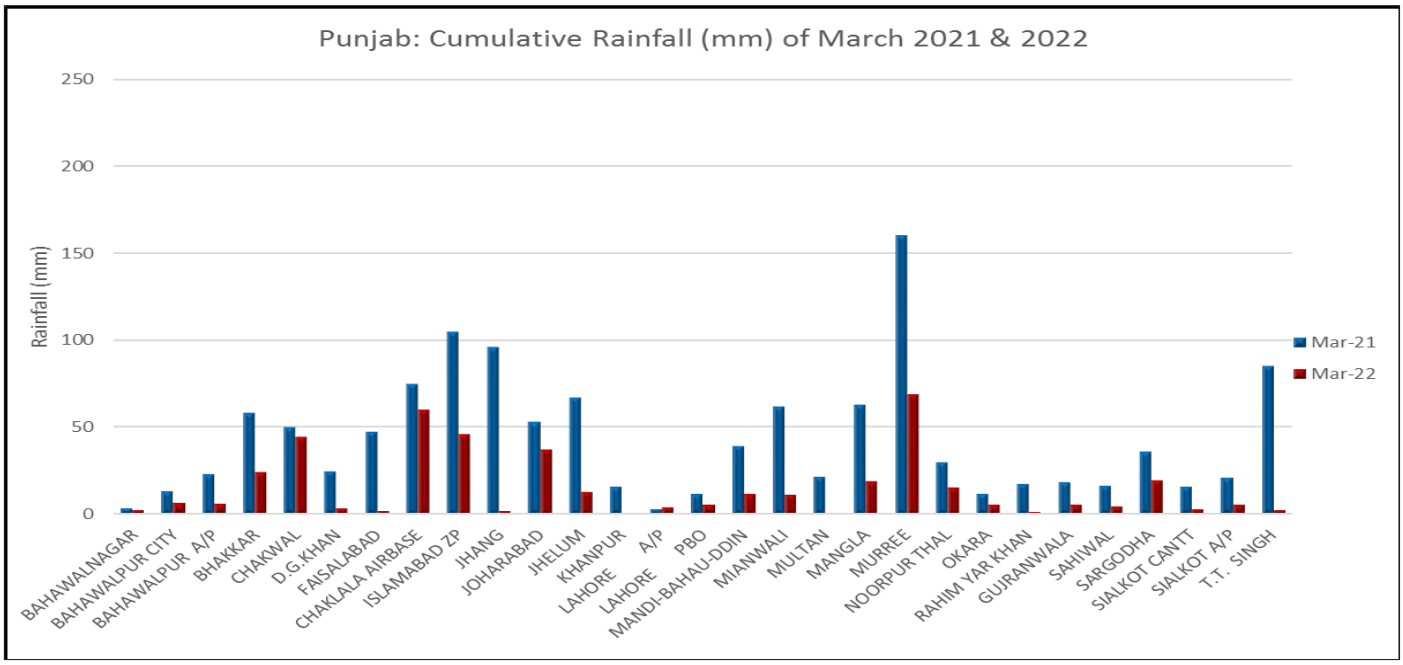


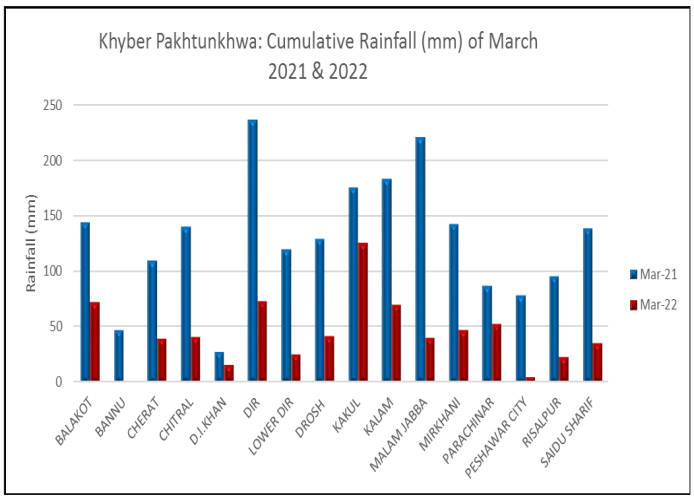


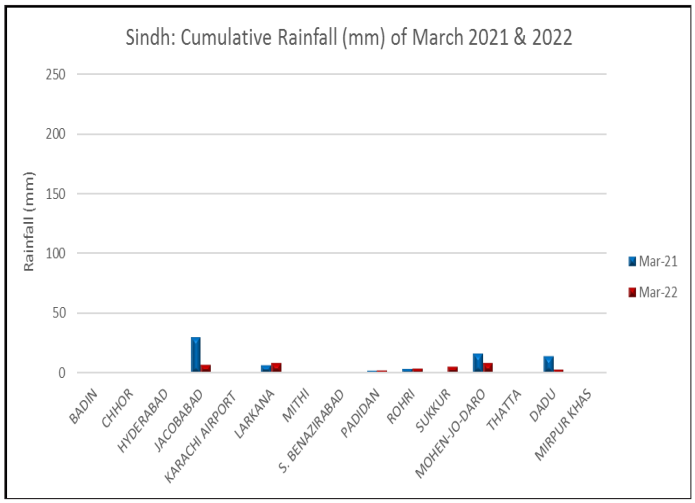
Source: Akbari Mandi

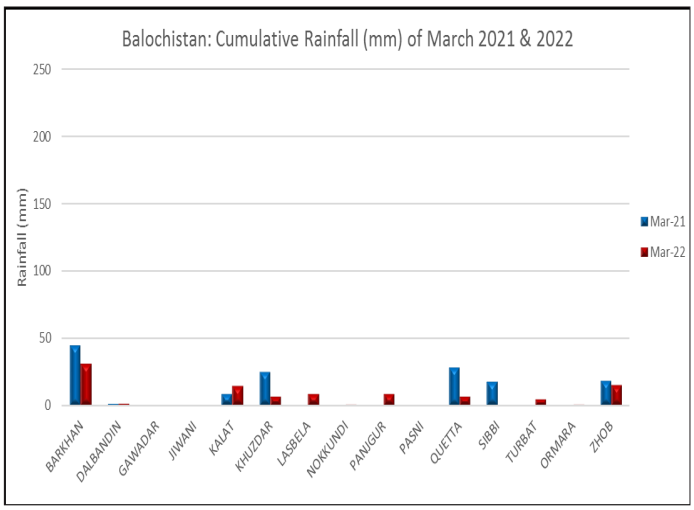
Source: ISO

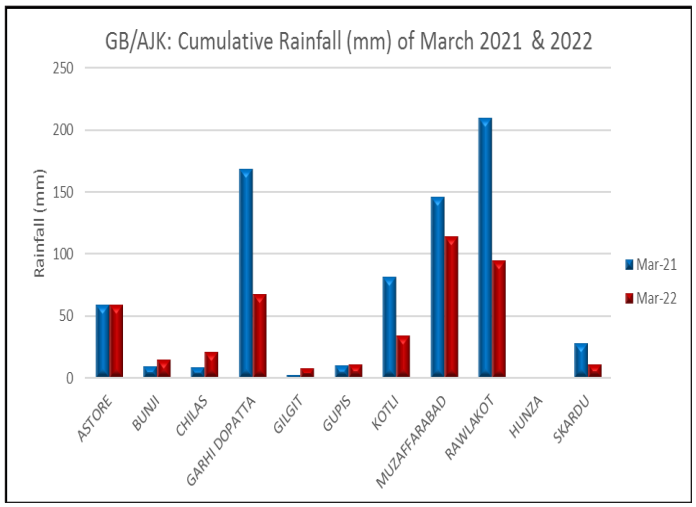
Monthly Rainfall (mm): March (2021 & 2022)







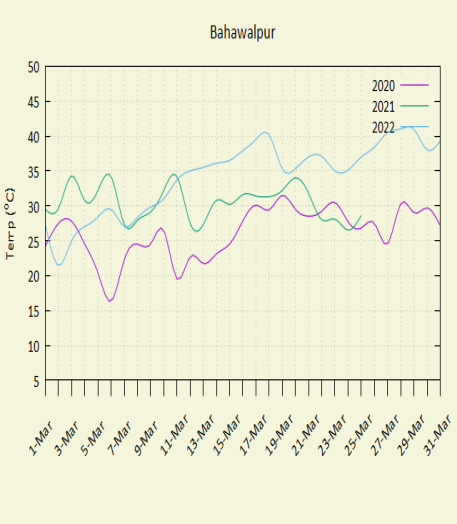


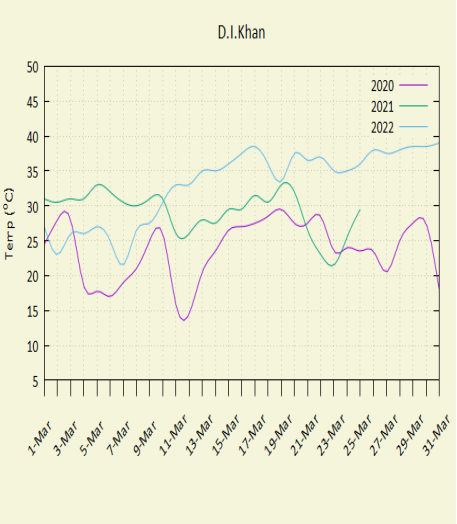


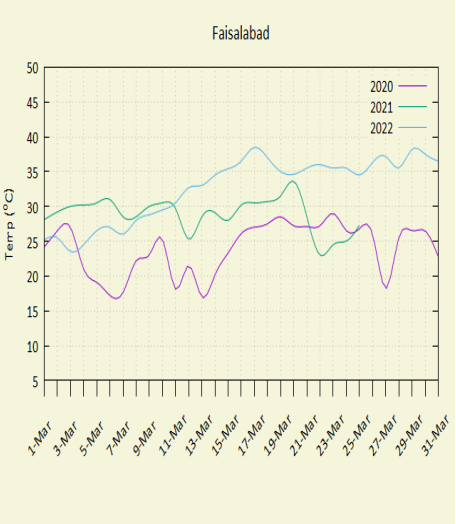
Source: PMD

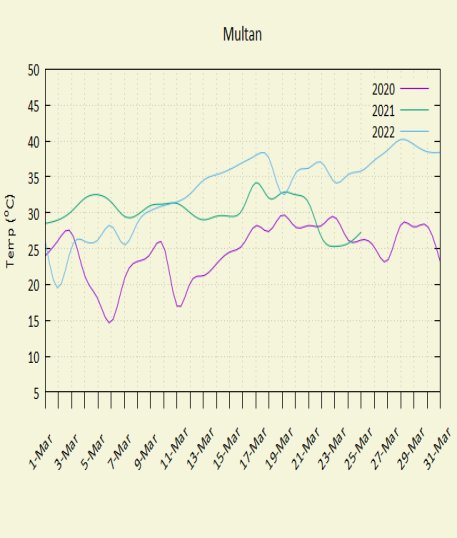
Maximum Temperature: March, 2022

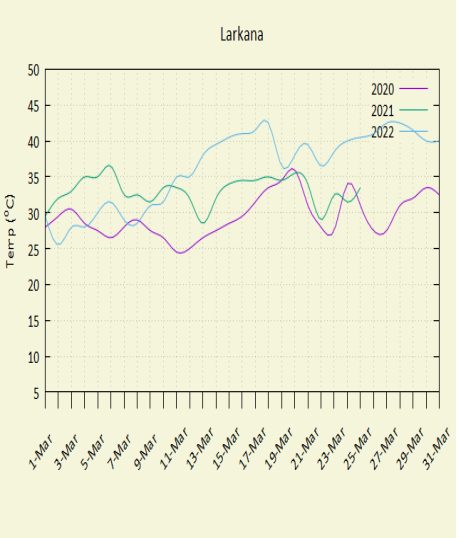
The ranges of maximum temperature (^{0}C) during March 2022 were as follows:

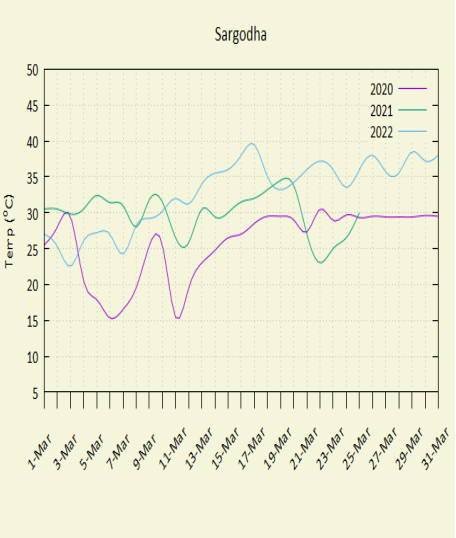


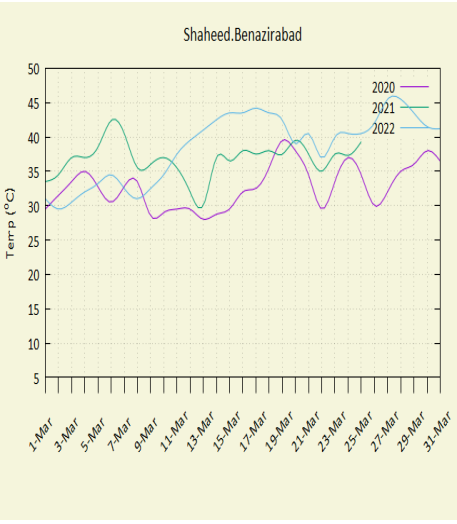


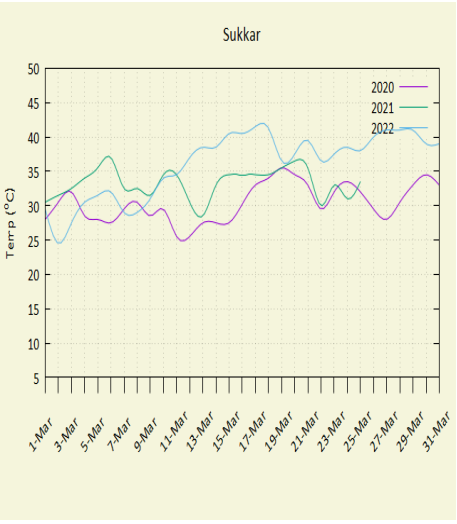


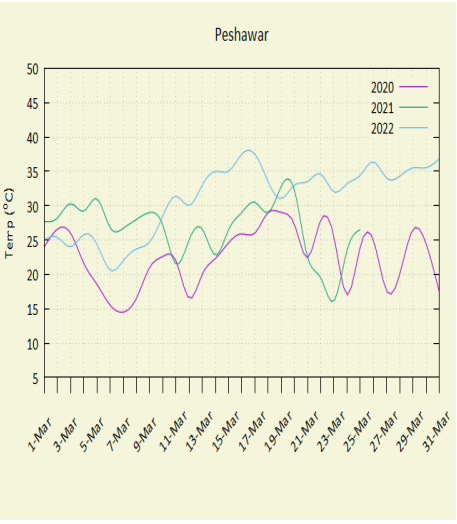












Source: PMD

Minimum Temperature: March, 2022

The ranges of minimum temperature (^{0}C) during March 2022 were as follows:

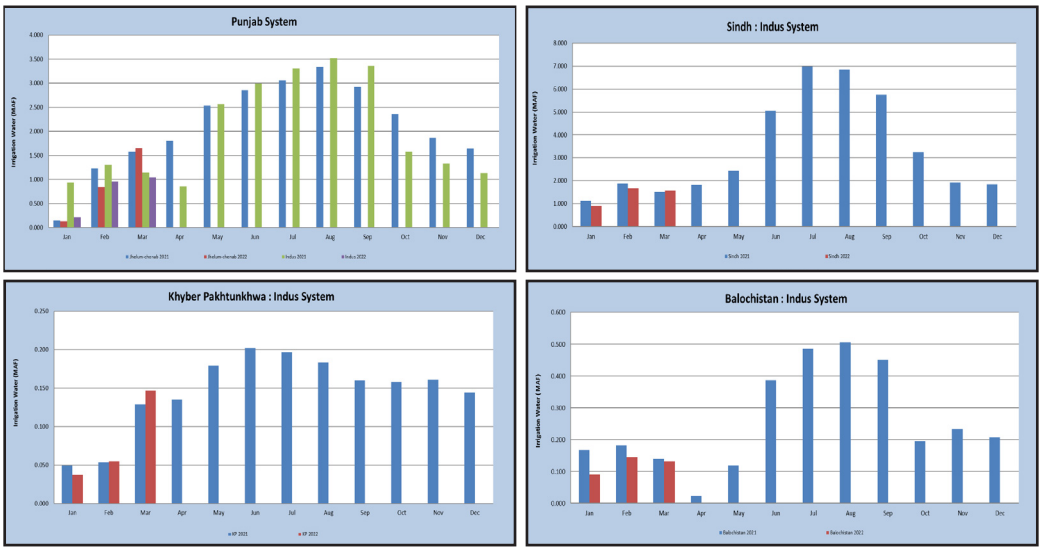
Source: PMD

Irrigation Water Supply: March, 2022

The irrigation water supply during March 2022 was 4.54 MAF against the last year's supply of 4.51 MAF, higher by 0.04 MAF (0.78 percent). During March 2022, as compared to the same time period of last year, the supply in Punjab was 2.69 MAF (lower by 0.90 percent), Sindh was 1.57 (higher by 3.22 percent), Khyber Pakhtunkhwa was 0.15 MAF (higher by 13.85 percent) while Balochistan received water supply of 0.13 MAF (lower by 5.11 percent).

	Month	Year	Punjab			Sindh	Khyber Pakhtunkhwa	Balochistan	Total
			Jhelum-Chenab	Indus	Total				
			Million Acre Feet						
Rabi 2021-22	Oct	2021	2.36	1.58	3.93	3.25	0.16	0.20	7.54
		2020	2.23	2.24	4.47	3.37	0.15	0.24	8.23
		Change	0.12	-0.66	-0.54	-0.12	0.01	-0.05	-0.69
		% change	5.57	-29.60	-12.03	-3.46	8.01	-19.08	-8.38
	Nov	2021	1.86	1.33	3.20	1.91	0.16	0.23	5.50
		2020	1.73	1.93	3.66	2.31	0.10	0.25	6.32
		Change	0.13	-0.60	-0.46	-0.40	0.06	-0.02	-0.82
		% change	7.68	-30.86	-12.64	-17.25	65.31	-7.81	-12.90
	Dec	2021	1.65	1.13	2.78	1.83	0.14	0.21	4.96
		2020	1.56	1.51	3.07	1.89	0.10	0.24	5.29
		Change	0.09	-0.38	-0.29	-0.06	0.04	-0.03	-0.33
		% change	5.63	-24.96	-9.43	-2.99	44.51	-13.60	-6.31
	Jan	2022	0.13	0.22	0.35	0.91	0.04	0.09	1.38
		2021	0.15	0.94	1.09	1.13	0.05	0.17	2.43
		Change	-0.01	-0.72	-0.74	-0.22	-0.01	-0.08	-1.04
		% change	-9.32	76.95	-67.81	-19.52	-24.00	-45.61	-43.00
	Feb	2022	0.84	0.96	1.26	1.66	0.05	0.14	3.66
		2021	1.23	1.30	2.53	1.87	0.05	0.18	4.64
		Change	-0.39	-0.34	-1.27	-0.20	0.00	-0.04	-0.97
		% change	-31.66	-26.21	-50.02	-10.93	2.22	-20.39	-20.93
	Mar	2022	1.65	1.04	2.69	1.57	0.15	0.13	4.54
		2021	1.58	1.14	2.72	1.52	0.13	0.14	4.51
		Change	0.07	-0.10	-0.02	0.05	0.02	-0.01	0.04
		% change	4.68	-8.60	-0.90	3.22	13.85	-5.11	0.78
	Total	2022	6.84	5.22	11.52	9.57	0.55	0.87	23.05
		2021	6.58	6.48	12.52	10.08	0.48	0.94	24.55
		Change	0.26	-1.26	-1.00	-0.52	0.08	-0.07	-1.50
		% change	3.91	-19.42	-7.99	-5.11	15.68	-7.02	-6.13

Source: Indus River System Authority (IRSA)



Source: Indus River System Authority (IRSA)

Fertilizer Offtake

As per report of NFDC, the month of February 2022 started with opening inventory of 27 thousand tons of Urea. During February 2022, domestic Urea production was 520 thousand tons with total availability of 537 thousand tons. Urea offtake during February remained 527 thousand tons leaving behind closing balance of 69 thousand tons.

The opening inventory of DAP for February 2022 was 228 thousand tons. During February 2022 domestic production of DAP was 70 thousand tons. The total availability of DAP was 314 thousand tons. DAP offtake during February 2022 was 55 thousand tons leaving behind closing balance of 259 thousand tons.

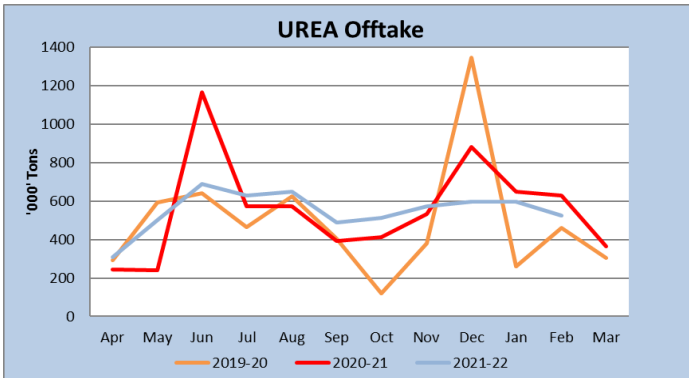
During February 2022, offtake of Nitrogen increased by 18.1 while that of Phosphate and Potash decreased by 29.1 and 30.9 percent, respectively as compared to same period of last year.

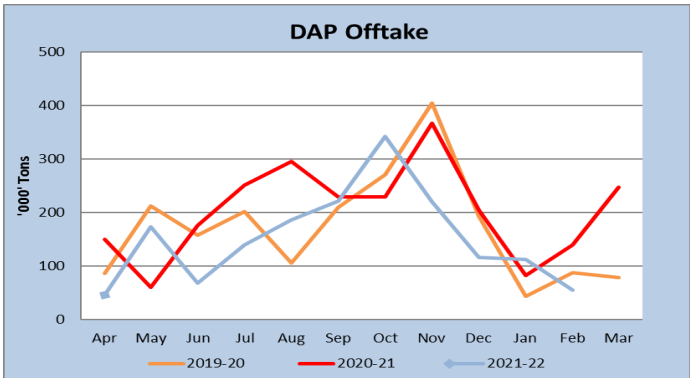
Product	Opening Inventory	Domestic Production	Imports	Total Availibility	Offtake	Write On/Off	Closing Balance
	000 Tons						
Urea	27	520	50	537	527	-1	69
DAP	228	70	16	314	55	0	259

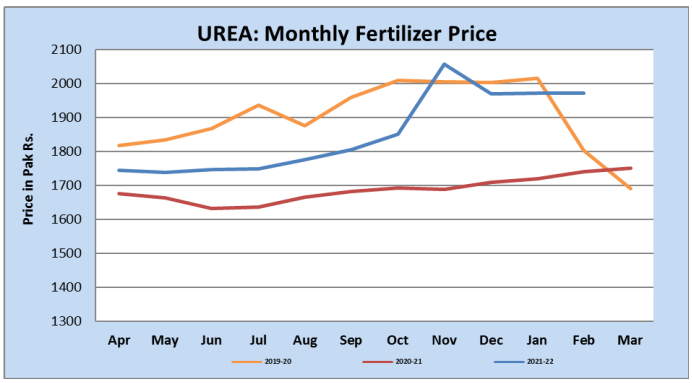
Month	Fertilizer Offtake Rabi 2021-22				Fertilizer Offtake Rabi 2020-21				% Change			
	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total	Nitrogen	Phosphate	Potash	Total
	(000 Tons)											
Oct	356.0	196.9	10.1	563.0	255.6	123.5	7.3	386.4	39.3	59.5	37.3	45.7
Nov	338.9	126.6	7.6	473.1	345.5	191.2	4.8	541.6	-1.9	-33.8	56.6	-12.6
Dec	332.3	70.3	5.1	407.7	481.6	111.8	3.8	597.2	-31.0	-37.2	34.4	-31.7
Jan	328.1	65.9	6.1	400.2	366.8	62.0	5.3	434.0	-10.5	6.4	16.4	-7.8
Feb	286.5	42.9	4.2	333.6	242.6	60.5	6.1	309.1	18.1	-29.1	-30.9	7.9
Total	1641.9	502.6	33.1	2177.6	1692.0	549.0	27.3	2268.3	-3.0	-8.4	21.2	-4.0

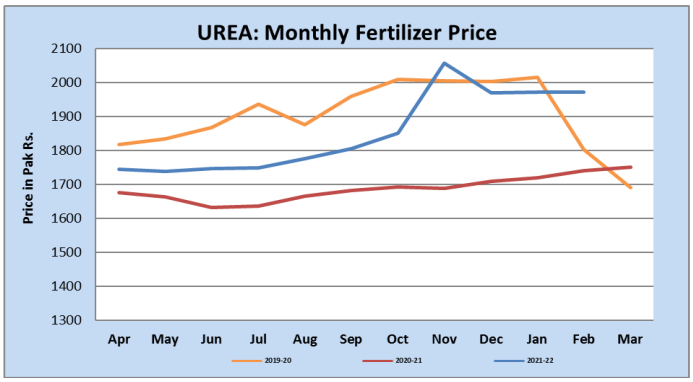
Source: MRR.03/2022 NFDC

The fertilizer statistics and prices are depicted in the graphs below:









Source: MRR.03/2022 NFDC

زرعی سفارشات

(ماہِ اپریل)

کپاس:۔

1.، گندم کی کٹائی کے بعد کپاس کی کاشت جلد از جلد کی جائے تاکہ بروقت کاشت سے پیداوار پر ہونے والے اثرات سے فائدہ اُٹھایا جاسکے۔

2۔کسان حضرات اپنے پچھلے تجربات، وقتِ کاشت، علاقائی موزونیت اور بیماریوں کے خلاف مدافعت رکھنے والی منظور شدہ/ تجویز کردہ اقسام کا انتخاب کریں۔

3۔زرخیز میرازمین کو ہموار اور نرم کرکے کپاس کی کاشت کی جائے۔

4۔شرح اگاؤ کی صلاحیت اور طریقہ کاشت کو مدِ نظر رکھتے ہوئے کپاس کا بیج 6تا10 کلو گرام فی ایکڑ استعمال کریں۔

5۔۔پودوں کی تعداد کا پورا ہونا بہترین پیداواری اصولوں میں سے کلیدی اصول ہے۔اس سے اگاؤ اور چھدرائی کے وقت پودوں کی تعداد کا مشاہدہ انتہائی ضروری ہے۔

6-کپاس کے بیج کو کاشت سے پہلے زرعی زہر لگانے سے فصل ایک ماہ تک رس چوسنے والے کیڑوں سے محفوظ رہتی ہے۔لہٰذا کاشت سے پہلے بیج کو زرعی زہر لگانا ضروری ہے۔

7۔اگیتی کپاس کو کھادوں کی ضرورت پچھیتی کاشت سے زیادہ ہوتی ہے۔اس لیے فصل کی حالت، زمین کی زرخیزی اور موسمی حالات کو مدِ نظر رکھتے ہوئے کھادوں کا متوازن اور مناسب استعمال پیداوار میں اضافہ کا باعث ہوتا ہے۔

8۔بی ٹی اقسام کے ساتھ نان بی ٹی (روایتی) اقسام بھی کم از کم دس فیصد رقبہ پر ضرور کاشت کریں تاکہ حملہ آور سنڈیوں میں بی ٹی اقسام کے خلاف مدافعت پیدا نہ ہو۔

9۔پٹریوں پر کاشتہ فصل کو پہلا پانی 3تا4 دن بعد جبکہ دوسرا، تیسرا اور چوتھا پانی 6تا9 دن کے وقفہ سے لگائیں۔اس کے بعد فصل کی ضرورت اور پانی کی کمی ظاہر ہونے پر تقریباً 10 سے 15 دن کے وقفہ سے لگائیں۔

10۔لائنوں میں کاشتہ فصل کو پہلا پانی 30تا35 دن بعد اور بقیہ پانی فصل کی ضرورت اور پانی کی کمی ظاہر ہونے پر مناسب وقفہ (12تا15 دن) پر لگائیں

11۔پودوں میں مناسب فاصلہ پودوں کی بہتر نشوونما اور کیڑوں کے بہتر تدارک کا ضامن ہے۔اس لیے اقسام کی خصوصیات اور وقتِ کاشت کو مدِ نظر رکھتے ہوئے پودوں کے درمیان 6 سے لیکر 12 انچ تک فاصلہ رکھیں۔

گندم:۔

1۔گندم کی فصل پکنے اور کٹائی کا عمل مارچ سے لیکر مئی تک جاری رہتا ہے۔پاکستان میں تقریباً4فیصد گندم برداشت و سنبھال کے دوران ضائع ہو جاتی ہے۔اس لیے گندم کی سنبھال اور ذخیرہ کے دوران خصوصی احتیاط کی جائے تاکہ محنت کا یہ ثمر ضائع نہ ہو۔

2۔کٹائی و گہائی کے تمام آلات و دیگر ضروریات کا پہلے ہی انتظام کر لیں تاکہ کٹائی و گہائی کے دوران کسی پریشانی کا سامنا نہ کرنا پڑے۔

3۔ریڈیو اور ٹی وی کی مدد سے موسمی حالات سے آگاہ رہیں۔موسم صاف ہونے کی صورت میں کٹائی کا عمل جاری رکھیں۔البتہ بارش کی صورت میں کٹائی کو روک دیں اور موسم بہتر ہونے کا انتظار کریں۔

4۔کٹائی کے بعد بھریاں چھوٹی اور سٹوں کا رخ اوپر کی طرف کر کے کھڑا کریں۔کھلواڑے چھوٹے رکھیں اور اونچے کھیت میں کھلیاں لگا کر ارد گرد کھائی بنائیں تاکہ بارش ہونے کی صورت میں نقصان کم سے کم ہو۔

5-آئندہ سال کے بیج کے حصول کے لیے صحت مند، جڑی بوٹیوں اور بیماریوں سے پاک ایک ہی قسم کے کھیت کا انتخاب کریں۔

6۔صحت مند بیج کے لیے گہائی کے بعد سیڈ گریڈر کی مدد سے کمزور دانے الگ کر دیں۔

بہاریہ مکئی:۔

1۔مناسب وقفے سے آبپاشی کا عمل جاری رکھیں۔بور آنے پر پانی کی کمی پیداوار میں کمی کا باعث بنتی ہے۔اس لیے کھیت کو ہمیشہ تر و تر حالت میں رکھیں لیکن پانی کھڑا نہ ہونے دیں۔

2۔زمین کی زرخیزی اور فصل کی حالت کو مدِ نظر رکھتے ہوئے کھادوں کا متناسب اور متوازن استعمال جاری رکھیں۔

3۔کونپل کی مکھی اور مکئی کے گڑوداں کے تدارک کے لیے ضرورت کے مطابق دانہ دار زہروں کا استعمال کریں۔

کماد:۔

1۔اپریل کے مہینے میں کماد کو نائٹروجن کھاد کی دوسری قسط ڈالیں۔اور فوراً آبپاشی دیں۔

2۔گوڈی کے عمل سے جڑی بوٹیوں کی تلفی کریں۔گوڈی کا عمل زمین نرم ہونے کی وجہ سے کماد کی جڑوں کو پھیلنے میں مدد دیتا ہے۔

3۔مقامی محکمہ زراعت کے عملہ کی مدد سے جڑ اور تنے کی گڑووں کی تلفی کے لیے مناسب دانہ دار زہروں کا انتخاب کریں۔

4۔دانہ دار زہر ڈالنے کے بعد کھیت کو لازمی پانی دیں۔

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