

## Foreword

This report is one of the series of reports on kitchen items including Potato, Onion, Tomato, Chili and Garlic, prepared on the direction of Mr. Fayyaz Bashir, Secretary Agriculture, Punjab, to identify problems prevailing in the supply chain of these items of daily use. The national data has been sorted out and comparison is made with the international situation to assess the gap. Secretary agriculture has been kind enough to spare time to discuss these reports in detail.

Onion is grown on an area 315 thousand acres with a total production of 1765 thousand tones. Per acre yield is far less as compared to the major producers. Punjab which is the major consumer contributes only 15 percent of total production and its production is concentrated to a span of 2 months. Prices are lowest when the Punjab's crop comes in market which is a disincentive for the growers to increase its area. Introduction of short day, medium day and long day varieties can be helpful to increase production and lengthen the supply period of Punjab crop. Erratic price fluctuations both cyclical and seasonal are observed every year. Onion dehydration and improvement in the storage of onions can help to stabilize prices and provide incentive for increase in onion production as well as its yield. Per acre yield of onions in Pakistan needs to be enhanced. There is a great need for production of good quality onion seeds and to evolve new high yielding varieties. Post harvest management is another area which can bring positive changes. The Suggestions to Regularize Supply and Prices are only to give line for new research and the detailed measures may be planned by the experts of pertinent field.

Efforts of **Dr. Sofia Anwer and Mr. Muhammad Irfan Bhatti** for collection and analysis of information for completion of this report are acknowledged.



**Munir Ahmad**  
Project Manager  
Agriculture Marketing Information Service  
Directorate of Agriculture  
(Economics and Marketing)  
Punjab Lahore





## Interpretive Summary

Onion has been cultivated for 5000 years or more. Since onions grew wild in various regions, they were probably consumed for thousands of years and domesticated simultaneously all over the world. Onions may be one of the earliest cultivated crops because they were less perishable than other foods of the time, were transportable, were easy to grow and could be grown in a variety of soils and climates. In addition, the onion was useful for sustaining human life.

It is estimated that annually about 57 million tons of onions are produced all over the world. In many parts of the world it is staple condiment of the people. Onion cultivation has steadily grown at the pace of about 3.9 per annum during the last 10 years. Whereas the production of onion has been increasing at the rate of 3.1% during this period. Overall onion production is increasing. It has reached 1765 thousand tones in 2005 with 30% increase from 808 million tones in 1991. There is a considerable diversity in sowing period of onion crop on Pakistan. The commodity keeps coming throughout the year from one ecological region or the other into various markets of the country. Sindh is the largest contributor in onion production having a share of about 40 % followed by Balochistan, Punjab and NWFP with a share of 33, 15 and 12 percent respectively. Sindh is the leading onion producing province in Pakistan followed by Balochistan, Punjab and NWFP.

Over all objective of Agriculture Sector is to increase farm productivity and ensure increased incomes for the farmers, especially small holders. With the expected increase in the country's population and per capita income, marketing is set to play a crucial role in ensuring that consumers obtain food at reasonable prices and farmers get returns remunerative enough to keep them involved in agricultural activities. To obtain this objective a comprehensive report entailing information about problems and prospects of production, marketing, pricing and processing of Onion is prepared.

## Problem in Onion Marketing

- Short period of supply from Punjab.
- Little contribution of Punjab in overall production.
- Low and stagnating yield of onion.
- Severe price fluctuations.
- Lack of value addition.

## Suggestions to Regularize Supply and Prices

- In short run import from neighboring countries.
- Increasing supply from Punjab.
- Production of onion seed and introduction of new varieties.
- Time period enhancement by introduction of short day varieties, medium day varieties, long day varieties and varieties for green consumption.
- Improvement in farm management practices leading to better quality and more yields.
- Balanced use of fertilizes along with micronutrients.
- Collection and dissemination of market information.
- Timely release of area and production estimation.
- Promotion of onion dehydration especially small plants for cottage industry.



## Introduction and Importance

Onion (*Allium cepa* L) is one of the important condiments widely used in all households all the year round. The green leaves and immature and mature bulbs are eaten raw or used in preparation of vegetables. Onions are used in soups, sauces and for seasoning foods. The small bulbs are pickled in vinegar. Recent research has suggested that onions in the diet may play a part in preventing cardiac disease and other ailments. Onion bulb is rich in phosphorus, calcium and carbohydrates. The pungency in onion is due to a volatile oil known as allyl-propyl disulphide.

Many archaeologists, botanists and food historians believe onions originated in central Asia. Other research suggests that onions were first grown in Iran and West Pakistan.



Most researchers agree that the onion has been cultivated for 5000 years or more. Since onions grew wild in various regions, they were probably consumed for thousands of years and domesticated simultaneously all over the world. Onions may be one of the earliest cultivated crops because they were less perishable than other foods of the time, were transportable, were easy to grow and could be grown in a variety of soils and climates. In addition, the onion was useful for sustaining human life. Onions prevented thirst and could be dried and preserved for later consumption when food might be scarce.

The onion is a bi-annual herb, usually grown as an annual. All its parts produce a strong onion odour when crushed. It has superficial root system, a very short flattened stem at the base of the plant, which increases in diameter as growth continues. Leaves are long, linear and hollow. A bulb is formed by thickening of the leaf bases when the plant reaches a certain stage of growth. The fruit is a globular capsule.

Onions are mentioned to have been eaten by the Israelites in the Bible. In Numbers 11:5, the children of Israel lament the meager desert diet enforced by the Exodus: "We remember the fish, which we did eat in Egypt freely, the cucumbers and the melons and the leeks and the onions and the garlic."

In India as early as the sixth century B.C., the famous medical treatise Charaka - Sanhita celebrates the onion as medicine - a diuretic, good for digestion, the heart, the eyes and the joints.

## Origin and Cultivation

Onion is believed to have originated in Central Asia, possibly in the Iran-Pakistan region. It has been cultivated since ancient times in the Middle East and India. It was a popular food in ancient Egypt, where it is depicted on tombs as early as 3200 B.C. and has been found in mummies. The Sanskrit equivalent for onion is palandu which has been mentioned in the Garuda Purana.



The great Indian sages, Maharishi Atreya and Lord Dhanwantri have described the use of onions in details. It is referred to in the *Bible*, when the Israelites complained of their hardships while being led by Moses from Egypt to the land of





Canaan about 1500 B.C. remembering the onions that they ate in Egypt.

Onion is frequently referred to in the literature from Hippocrates, 430 B.C. down to the present time. It is on record that the Jews loved onions so much that they named a city after it -Onion. This city was built in 173 B.C. near the Gulf of Suez. The man who built it was called Onions. The city existed for 343 years.

Onion is now cultivated in most parts of the world, including India, Malaysia, Indonesia, Burma, Philippines, China, Egypt, West and East Africa, tropical South and Central America and the Caribbean.

### Nutritional Composition Amount / 100 g edible portion

Compared with other fresh vegetables, it is relatively high in food value, moderate in protein content and is rich in calcium and riboflavin. There is considerable variation in composition between different varieties and it also varies with the stage of maturity and the length of storage. The odour in onion is due to organic sulfur compounds, and is produced only when the tissues are cut or injured.



Dried onions contribute carbohydrates and minerals to the human diet but are not a good source of other nutrients and are used primarily as a flavoring. Green onions are higher in vitamins and minerals than onion bulbs. Garlic is much better nutritionally than either green or dried onions.



Components	Onion (dry)	Onion (fresh)	Garlic
Water (%)	91	92	59
Energy (Kcal)	34	25	149
Protein (g)	1.2	1.7	6.4
Fat (g)	0.3	0.1	0.5
Carbohydrate (g)	7.3	5.6	33.1
Fiber (g)	0.4	0.8	1.5
Ca (mg)	25	60	161
P (mg)	29	33	153
Fe (mg)	0.4	1.9	1.7
Na (mg)	2	4	17
K (mg)	155	257	401
Ascorbic acid (mg)	0	5,000	0
Vitamin A (mg)	8.4	45	31.2

## Per Capita Consumption (Kg per person per year)

Sr. No.	Countries	2000	2001	2002	2003	2004
1	Libyan Arab Jamahiriya	32.21	31.98	31.48	30.82	39.43
2	United Arab Emirates	21.85	22.09	24.48	25.72	38.99
3	Korea, Republic of	16.95	20.56	17.70	15.50	30.24
4	Turkey	25.91	22.67	21.92	17.75	25.46
5	Morocco	11.36	17.13	19.22	21.25	24.22
6	Greece	19.27	19.03	19.26	19.90	22.16
7	Kyrgyzstan	26.42	28.23	15.19	18.49	20.75
8	Spain	16.71	17.78	17.53	16.53	20.44
9	Tajikistan	15.60	17.98	17.27	17.61	20.39
10	Niger	25.51	18.52	16.99	16.51	19.69
<b>Top Ten Countries</b>		21.18	21.60	20.11	20.01	26.18
63	<b>Pakistan</b>	<b>25.51</b>	<b>18.52</b>	<b>16.99</b>	<b>16.51</b>	<b>19.69</b>
<b>World</b>		<b>6.83</b>	<b>6.96</b>	<b>6.71</b>	<b>6.71</b>	<b>7.85</b>

\*Includes processed onions.

## World Cultivation of Onion

It is estimated that annually about 78 million acres of onions are cultivated all over the world. China and India contribute almost half of world onion cultivation. The world market for onion is expanding with the increase in global population. Therefore, dire need is to increase in the onion cultivation.

Sr. No.	Countries	2003	2004	2005	%age share
		Area in '000' Acers			
1	China	1978.40	2102.50	2226.04	28.36
2	India	1309.68	1309.68	1309.68	16.69
3	Russian Federation	291.91	313.83	321.24	4.09
4	<b>Pakistan</b>	<b>266.93</b>	<b>269.18</b>	<b>315.56</b>	<b>4.02</b>
5	Indonesia	217.53	219.20	211.36	2.69
6	Turkey	202.63	192.75	192.75	2.46
7	Viet Nam	187.80	187.80	187.80	2.39
8	United States of America	166.08	168.95	161.54	2.06
9	Myanmar	144.41	144.56	145.79	1.86
10	Ukraine	128.74	140.61	143.32	1.83
<b>Sub total:</b>		<b>4894.13</b>	<b>5049.06</b>	<b>5215.09</b>	<b>66.45</b>
<b>Others124 Countries</b>		<b>2579.32</b>	<b>2612.96</b>	<b>2633.01</b>	<b>33.55</b>
<b>Grand Total:</b>		<b>7473.45</b>	<b>7662.01</b>	<b>7848.10</b>	<b>100.00</b>

Source: FAO





## Top Producing Countries of Onions in World

It is estimated that annually about 57 million tons of onions are produced all over the world. In many parts of the world it is staple food of the people. China and India contribute almost half of world onion production. The world market for onion is expanding with the increase in global population. The statistics reveal that exporting countries are almost maintaining their share with of course some bad years due to bad crop.

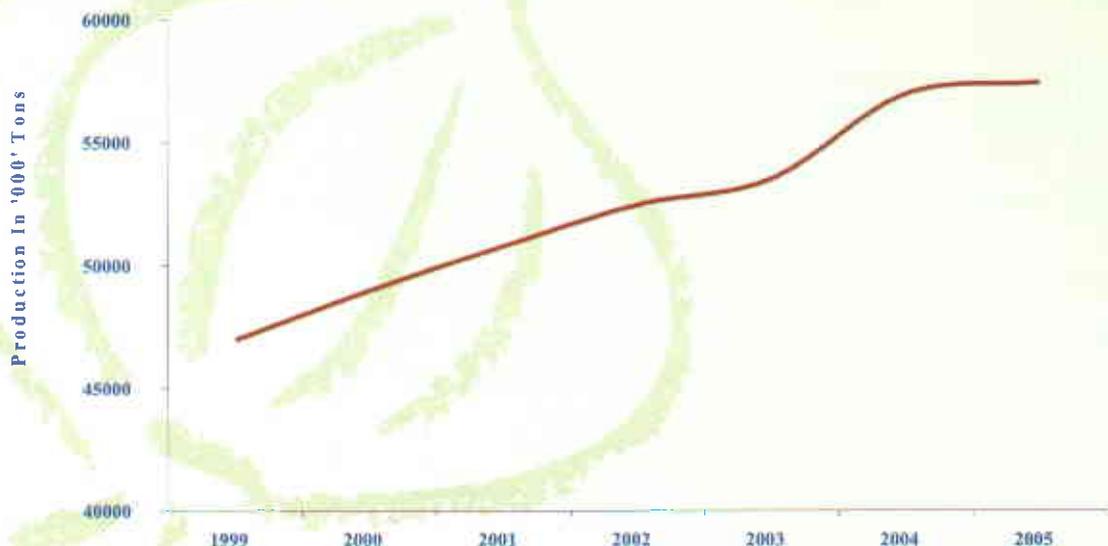
Sr. No.	Countries	2003	2004	2005	%age share
		Production in '000' Tons			
1	China	17536	18047	19047	33.15
2	India	5500	5500	5500	9.57
3	United States of America	3328	3765	3346	5.82
4	Turkey	1750	2040	2000	3.48
5	<b>Pakistan</b>	1427	1449	1765	3.07
6	Russian Federation	1565	1673	1748	3.04
7	Iran, Islamic Rep of	1500	1450	1450	2.52
8	Egypt	686	895	1302	2.27
9	Japan	1172	1128	1083	1.88
10	Brazil	1230	1158	1059	1.84
<b>Top Ten Total:</b>		<b>35694</b>	<b>37105</b>	<b>38300</b>	<b>66.66</b>
<b>Others 124 Countries</b>		<b>17841</b>	<b>19875</b>	<b>19159</b>	<b>33.34</b>
<b>World:</b>		<b>53535</b>	<b>56981</b>	<b>57459</b>	<b>100.00</b>

Source: FAO



## Yield and Productivity

As for as onion production is concerned Pakistan is at 5<sup>th</sup> position in the whole world, but for yield the situation is not worth cheering about and our position is 75<sup>th</sup> in the community of 124 onion producers.



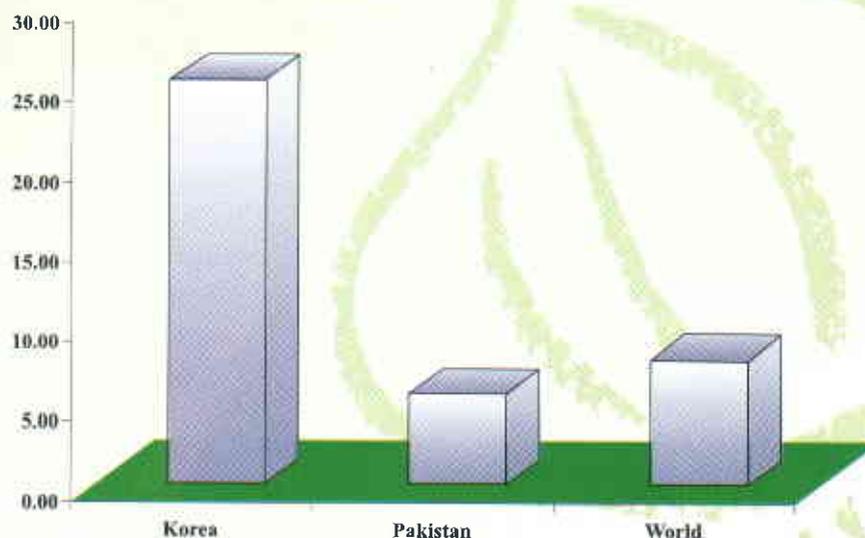
## Onion Yield of Leading Countries

Sr. No.	Countries	2002	2003	2004	2005
		Yield Tons/Acers			
1	Korea, Republic of	24.66	24.41	24.65	25.29
2	Ireland	22.63	20.04	22.63	22.63
3	Netherlands	22.35	14.23	19.06	21.58
4	United States of America	19.47	20.04	22.29	20.71
5	Chile	19.61	19.66	19.69	19.72
6	Japan	20.30	20.18	19.85	19.06
7	Spain	19.24	17.78	19.23	18.75
8	Germany	17.14	13.97	18.92	18.68
9	France	17.61	14.59	18.10	17.75
10	Austria	19.30	16.58	17.50	17.51
<b>Sub total:</b>		20.23	18.15	20.19	20.17
75	<b>Pakistan</b>	<b>5.40</b>	<b>5.35</b>	<b>5.38</b>	<b>5.59</b>
<b>Others124 Countries</b>		6.51	6.43	6.82	6.66
<b>World Average</b>		<b>7.55</b>	<b>7.32</b>	<b>7.84</b>	<b>7.68</b>

Source: FAO

Pakistan Yield of onion is below the world average i.e. 5.59 tones per acre as compared to that of 7.68 for the world, whereas the highest yield received by Korea is 25.29 tone per Acre. There is great scope of increasing production from the same area by increasing per acre yields. Most of the major producers are getting yield of more than 20 Tones per Acre. The yield position of Pakistan relative to the world average and the world highest is given

### World Yield Comparison Tons/Acres for the Year 2004-05





## Onion Cultivation in Pakistan

Area In '000' acres

Year	Punjab	Sindh	NWFP	Balochistan	Pakistan
1995-96	49.42	81.05	16.80	45.22	192.50
1996-97	50.66	81.79	17.54	49.42	199.42
1997-98	51.89	82.78	15.57	50.90	201.15
1998-99	54.86	85.25	20.02	51.15	211.28
1999-00	55.60	122.07	24.46	69.19	271.33
2000-01	57.08	128.00	26.19	49.67	260.95
2001-02	59.06	123.06	23.72	50.66	256.50
2002-03	65.24	132.45	24.71	44.48	266.88
2003-04	66.72	124.30	25.21	53.13	269.35
2004-05	68.45	142.58	27.18	77.59	315.81

Source: Agricultural Statistics of Pakistan

Pakistan annually produces about 1.5 million tons of onion. Though subjected to annual variations, overall area under onions in Pakistan have shown an increasing trend during the last decade.

## Onion Production in Pakistan

Onion in Punjab is mainly produced in Southern part comprising of Khanewal, Vehari, Okara, D. G. Khan, Bahawalpur and R. Y. Khan districts. Ghotki, Nausherhro Feroze, Nawabshah, Shikarpur, Sanghar, Mirpur Khas and Hyderabad are main onion producing district in Sindh. Similarly Swat and Dir in NWFP and Mastung, kalat and Chagai are main onion producing districts in Balochistan.

Onion cultivation has steadily grown at the pace of about 3.9 per annum during the last 10 years. Whereas the production of onion has been increasing at the rate of 3.1% during this period. Overall onion production is increasing. It has reached 1765 thousand tones in 2005 with 118.31% increase from 808 thousands tones in 1991, which is given in the table below:

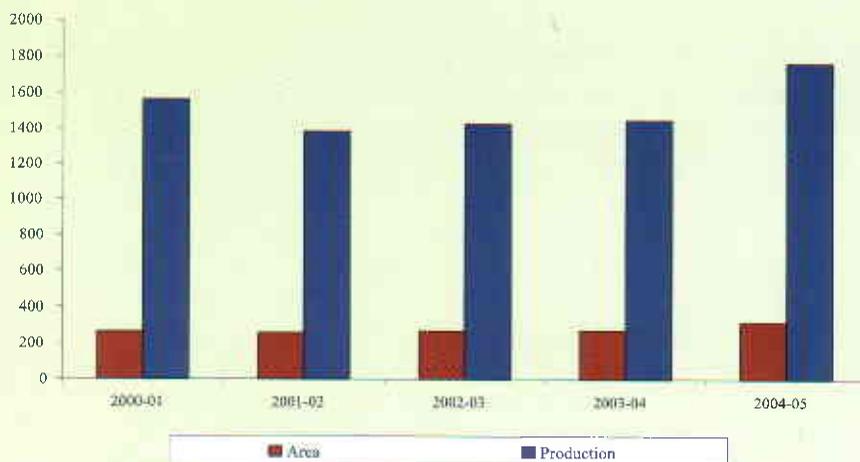
Production In '000' Tones

Year	Punjab	Sindh	NWFP	Balochistan	Pakistan
1991-92	158.10	299.70	77.20	273.90	808.90
1992-93	171.80	303.60	88.30	290.00	853.70
1993-94	182.90	322.40	93.20	313.00	911.50
1994-95	205.20	354.70	90.10	363.10	1013.10
1995-96	212.10	425.20	93.30	367.00	1097.60
1996-97	218.20	425.70	84.70	402.40	1131.00
1997-98	225.70	430.30	90.20	330.30	1076.50
1998-99	230.80	457.00	120.50	329.90	1138.20
1999-00	247.60	703.80	147.00	549.60	1648.00
2000-01	251.30	739.30	201.50	371.20	1563.30
2001-02	225.00	596.00	183.20	380.20	1384.40
2002-03	263.20	637.70	193.60	333.00	1427.50
2003-04	251.20	610.70	192.20	394.90	1449.00
2004-05	264.60	710.70	210.90	578.70	1764.90

Source: Agricultural Statistics of Pakistan



## Area & Production of Onion



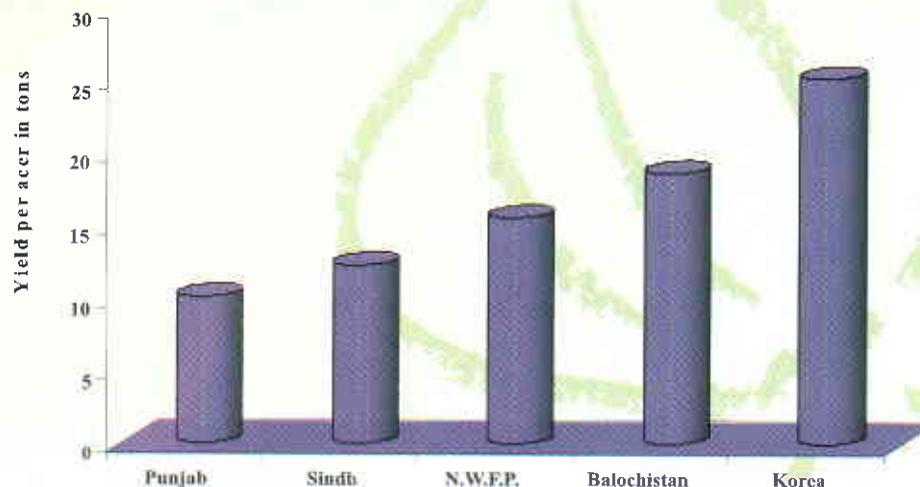
## Onion Yield in Pakistan

*Yield Per acre In tones*

Year	Punjab	Sindh	N.W.F.P.	Balochistan	Pakistan
1995-96	10.61	12.96	13.72	20.06	<b>14.09</b>
1996-97	10.64	12.86	11.93	20.12	<b>14.01</b>
1997-98	10.75	12.85	14.32	16.03	<b>13.22</b>
1998-99	10.40	13.25	14.88	15.94	<b>13.31</b>
1999-00	11.00	14.25	14.85	19.63	<b>15.01</b>
2000-01	10.88	14.27	19.01	18.47	<b>14.80</b>
2001-02	9.40	12.00	19.10	18.50	<b>13.34</b>
2002-03	10.00	11.90	19.30	18.50	<b>13.22</b>
2003-04	9.30	12.10	18.90	18.40	<b>13.29</b>
2004-05	9.60	12.30	19.20	18.40	<b>13.81</b>

Source: Agriculture Statistics of Pakistan

## Yield trend of onion in Pakistan & leading Korea in yield

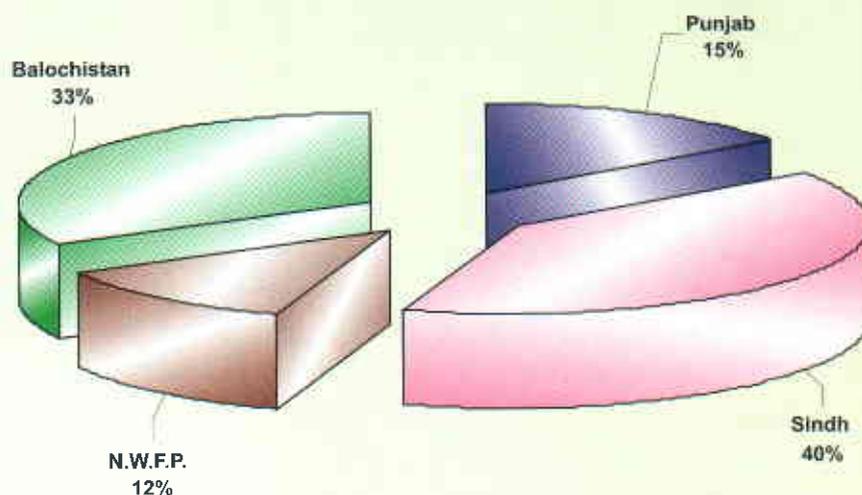




## Province wise Production Share of Onion Crop for the Year 2004-2005

There is a considerable diversity in sowing period of onion crop on Pakistan. The commodity keeps coming throughout the year from one ecological region or the other into various markets of the country. Sindh is the largest contributor in onion production having a share of about 40 % followed by Balochistan, Punjab and NWFP with a share of 33, 15 and 12 percent respectively.

Sindh is the leading onion producing province in Pakistan followed by Balochistan, Punjab and NWFP. Province-wise production share of onion are presented in the chart.



## Onion Cultivation in Punjab

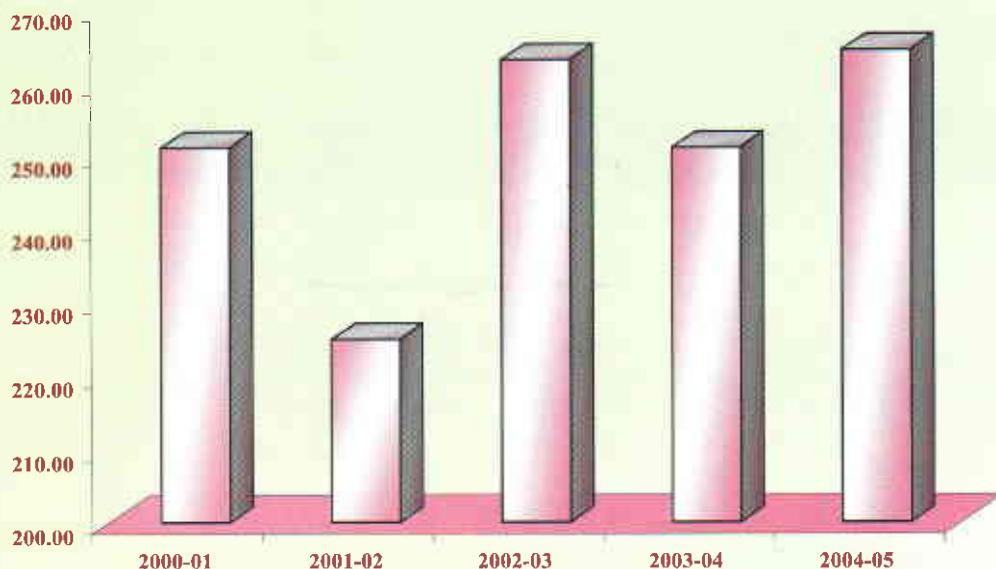
Area, Production and Yield of the Onion in the Punjab

Year	Area (in '000' Acers)	%change over Last Year	Production (in '000' Tones)	%change over Last Year	Average Yield (Maund/Acers)	%change over Last Year
1999-00	55.48	1.15	247.55	6.77	119.55	5.68
2000-01	57.06	2.77	250.00	0.98	117.42	-1.81
2001-02	59.06	3.39	263.00	4.94	119.31	1.58
2002-03	65.24	9.47	263.20	0.08	133.54	10.66
2003-04	66.72	2.22	251.20	-4.78	134.56	0.75
2004-05	68.45	2.53	264.60	5.06	139.61	3.62
2005-06	68.60	0.22	275.00	3.78	139.80	0.13

Source: Agriculture Statistics of Pakistan

The trend of onion cultivation in Punjab is on increase. Both area under cultivation and production have jointly increased by at least 4% but yield is stagnant. Onion appears to be a neglected crop at research level in presence of the much higher yields exploited by many other countries.

### Trend of Area of Onion in Punjab



Area under onion crop is highly correlated to the last year price. It has been calculated as 0.87.

### District wise Area & Production of Onion in the Punjab for the year 2005-06

Area in acres  
Production in Tones

Sr. No.	District	Area	Production	%age Share
1	Kasur	6560	23995	7.830
2	Bahawalpur	5950	23985	7.827
3	Khanewal	5900	20260	6.611
4	Vehari	5742	19932	6.504
5	Lodhran	4000	19259	6.285
6	Okara	4550	17492	5.708
7	D.G. Khan	3650	16348	5.335
8	Multan	4000	14183	4.628
9	Nankana Sahib	3500	14109	4.604
10	Rahim Yar Khan	4500	13605	4.440
<b>Top Ten Districts:</b>		<b>48352</b>	<b>183168</b>	<b>59.771</b>
<b>Other 25 Districts:</b>		<b>32324</b>	<b>123282</b>	<b>40.229</b>
<b>Total Punjab</b>		<b>80676</b>	<b>306450</b>	<b>100.000</b>

Source: Crop Reporting Service Punjab





## Trade Cycle of Onion

The agro-ecological diversity obtained in the country enables production of onions almost around the year. The onion crop is harvested from April to August. The augmented supplies tend to keep prices in the domestic market low thereby offering an opportunity for export. Therefore, onion exports are mainly undertaken during this period, predominantly from Sindh crop. Due to limited shelf life and absence of suitable cold storage facilities in the country, onions can not be held over an extended period and have to be disposed in the domestic and international market as fresh harvest.

Province	Major Producing Areas	Availability in Market
Sindh	Tandoallyar, Badin, Mirpur -Khas, Hyderabad, Dadu, Nasar Pur, Tando Muhammad Khan, Nawab Shah, Shikarpur, Larkana, Sukhar Ghotki, Jacobabad.	November to April
Punjab	Multan, Khanewal, Vehari, Lodhran, Khanpur, Dera Ghazi Khan, Rohjan, Alipur, R. Y.Khan, Sahiwal, Sheikhpura, Kasur, Jhang, Gujranwala, Toba Tek Singh, Faisalabad, Bahawalpur, Okara.	May to July
NWFP	Swat, Deer, Peshawar, Hazara, Kohat, Mardan, Malakand, Mohmand Agency, Bunir, Mansehra	August to October
Balochistan	Mastung, Qalat, Kharan, Qila Saifullah, Kardgas, Panjpir, Khuzdar, Ghiasabad, Pishin, Turbet, Loralai, Kanak, Quetta, Las bella, Chaghi.	August to October
	Naseerabad, Jaffarabad, Jhal Magsi, Bolan	October to November



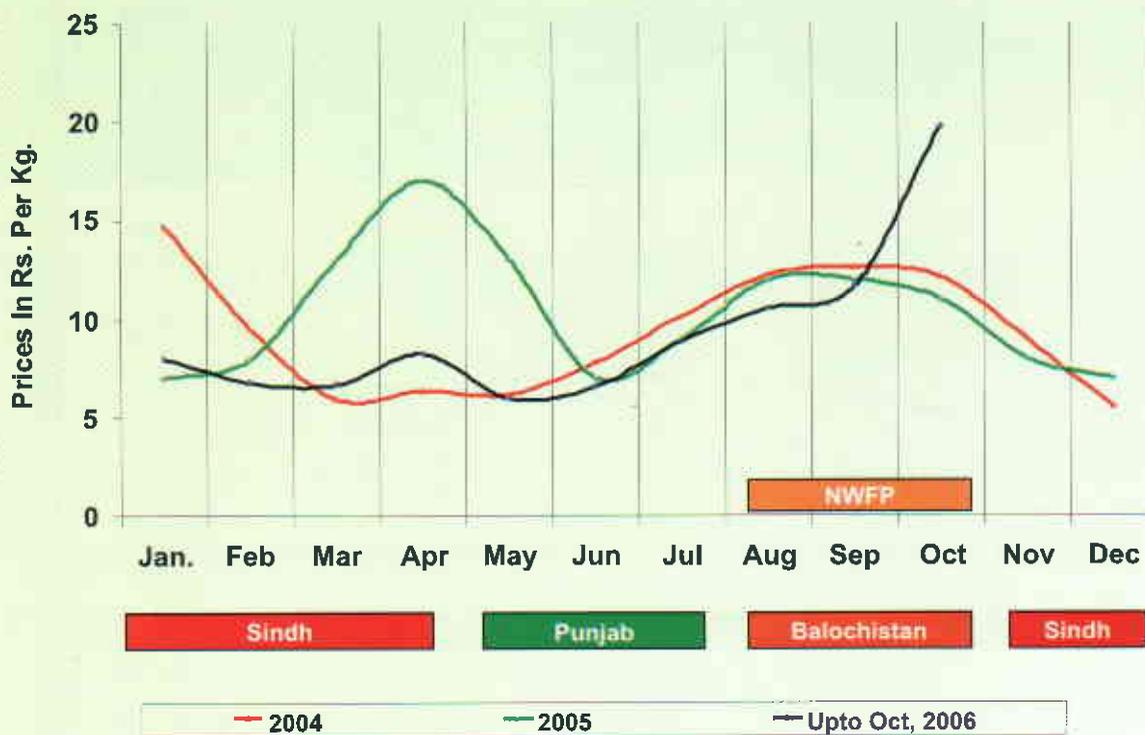
The producers obtained net profit of Rs. 370/bag at the end of season and Rs. 100 bag during mid season. There is a similar pattern for wholesalers and retailers. The main sources of market information for onion growers are commission agents transporters and neighbouring growers. There is no effective dissemination of market information among growers that can help them decide the best time to bring produce to the market. The producer's share of the retail price was calculated to be 57%. The other shares were commission agents (10%), wholesaler (13%) and retailer (20%).

## Supply Mechanism of Onion

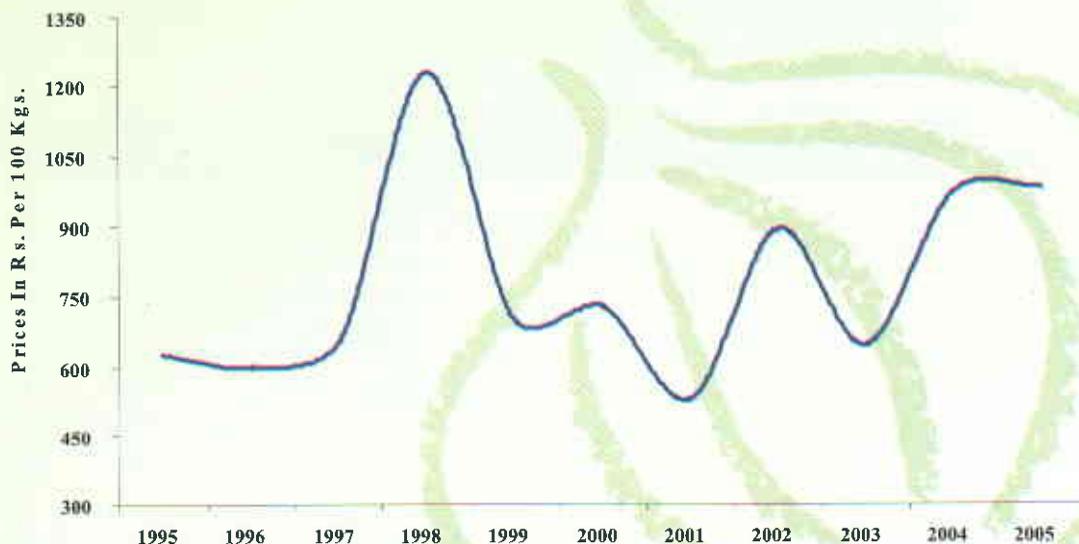
Onion is considered one of the ancient and important condiments of daily use. It is consumed both as vegetable and salad. It has a medicinal value for cardiac and germicidal action. Onion is a Perishable commodity particularly at the high temperature and humid conditions are very much detrimental to its shelf life. Moderate and dry temperature is suitable for proper bulb formation as well as at harvest and post harvest storage. The onion crop is sensitive to frost and snow and its mortality is extra ordinary high under such condition.

Sindh province contributes major portion of production, which is about 40 percent. Balochistan is second with 31 percent, Punjab contributes 21 and NWFP 8 percent. All the provinces are inter dependent for the supply of onion during different seasons. The supply period of different provinces is shown in the trade cycle of onion along with the major producing areas of the respective province.

## Price Comparison of Onion



## Long Term Trend of Onion



Long term Price trend of onion is increasing during the last decade with acute crises during the year 1997-98 the trend has been worked on the average price of main markets in the Punjab province.

Since the onion is supplied from different provinces throughout the year, there is a great price fluctuation. Seasonal price trend/fluctuations have been worked out for main markets of Punjab for last three years. It is

