

SPECIAL ISSUE: OUTLOOK OF KOREAN AGRICULTURE

**SITUATION AND OUTLOOK OF VEGETABLE SECTOR**

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**key words:** vegetable, red pepper, garlic, onion, chinese cabbage, radish, kimchi, outlook

**ABSTRACT**

Red pepper area is forecast to be reduced to 61,200ha(2011). Yield per 10a is expected to increase to 327kg(2011). As a result, production is estimated to be 200,000ton(2011). Garlic area is forecast to be reduced to 36,000ha(2011). Yield per 10a is expected to increase to 1,416kg(2011). As a result, production is estimated to be 513,000ton(2011). Onion area is forecast to be increased to 19,800ha(2011). Yield per 10a is expected to increase to 6,100kg(2011). As a result, production is estimated to be 1.21million ton(2011) Planted areas of Chinese cabbage and radish have slightly fallen in 1991/2000. Autumn planting of both has declined about 3%, but Spring and Summer planting have risen up. It shows that demand for chinese cabbage and radish has been constant throughout the year. Demand for chinese cabbage and radish is forecast to remain flat in Spring, increase slightly in Summer, and decrease in Autumn. According to this, whole demands will be likely to slowdown. Reduction in demands will likely lead to decreasing planted area.

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## I. Red pepper

### 1. Production and Demand

Planted area of red pepper increased to 90,762ha in 1996, but it was reduced to 74,471 ha in 2000.

In case of tunnel planting, yield per 10a is over 30 percent higher than that of mulching planting. Therefore, tunnel planting area expanded and accounted for 12.3 percent in 2000 up from 10.3 percent in 1996. In addition, planted area of large sized red pepper has been trending upward.

As a result, yield per 10a of red pepper is expected to rise. Average Yield per 10a of 1996~2000 (213kg/10a) has also been increased than that of 1991~1995 (253kg/10a).

Annual use of red pepper was around 150,000~165,000 ton (per capita use: 3.4~3.6kg) until 1991, but it increased about 170,000~180,000 ton in 1992/1993, 190,000~200,000 ton in 1994~1997 (per capita use: 4.0~4.5kg). Reduced production, led red pepper use to 176,500 ton (per capita use; 3.8kg) in 1998.

TABLE 1. Area, Yield and Production by Cultivating Methods

	Unit	1996	1997	1998	1999	2000
Area	ha	90,762	77,549	65,344	75,574	74,471
tunnel	%	10.3	11.0	11.0	11.4	12.3
mulching		89.7	89.0	89.0	88.6	87.7
Yield	kg/10a	241	259	224	285	260
tunnel		293	342	309	382	342
mulching		235	248	214	273	249
Production	1,000m/t	218.5	200.7	146.6	215.4	193.8
tunnel		27.4	30.0	22.2	32.8	31.3
mulching		191.1	170.7	124.4	182.6	162.5

Source: MAF, 「Trend and Analysis of Production in 2000」

However, it rose again 194,000ton (per capita use; 4.3kg) in 2000.

Due to relatively high price of domestic yields, compared with imports from China, imports by private sector are forecast to reach a record 7,500 ton. Total supplies (including imports, domestics, and MMA 2,500 ton) is estimated to be approximately 207,000 ton, down 5 percent from the previous year, but 2 percent above the average record level.

## **2. Expectancy of Production and Supply & Demand**

### *2.1. Expectancy of Production*

Planted area is expected to rise to 76,700 ha, up 3% from a year ago, and 1% above the average record level. As to the way of planting, tunnel planting is going to increase than mulching planting. As for seed, it is changed into species which can gain large-sized crops and resist strongly to disease and harmful insects. As a result, yield per 10a is expected to become 263kg, up 4% from the previous average year record (253kg) and yield is estimated to be 202, 000 ton- 4% above, compared to a year earlier.

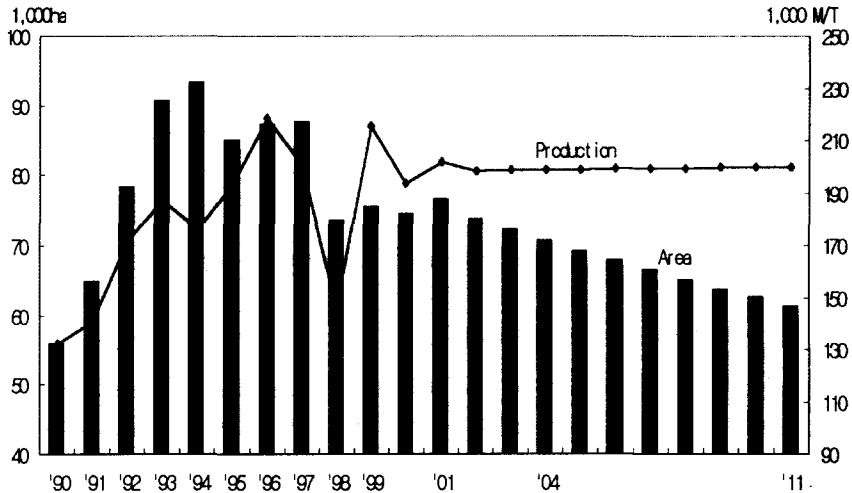
Planted area is forecast to be reduced to 70,700ha (in 2004), and 61,200ha (in 2011). Yield per 10a is expected to increase to 281kg (in 2004), and 327kg (in 2011). As a result, production is estimated to be 199,000 ton (in 2004), and 200,000 ton (in 2011).

### *2.2. Expectancy of Supply & Demand*

Demand for Kimchi is forecast to be down, so consumption of red pepper will likely follow this situation. Per capita use of red pepper is expected to be reduced slightly 4.3kg(in 2001), 4.2kg(in 2004), and around 4.1kg(in 2011).

Therefore, we expect that planted area will be 61,200ha, and that yield per 10a will be 327kg, and that production will be 200,000 ton. Adding 10,000 ton of imports and yields, total supplies are expected to be 210,000 ton. Use per person is forecast to be down to 4.1kg.

**FIGURE 1.** Projected Area and Production



## II. Garlic

### 1. Trend of Production and Supply & Demand

#### 1.1. Trend of Production

Planted area was 42,000 ha in 1996 by following upward trend since 1994. Dropped price in 1995~1996 led planted area to be 36,292ha~ down 14% from the previous year, 37,337ha (in 1998). In 2000, it was 44,941ha- up 6% from the previous year, 42,416ha (in 1999).

Garlic for cool- region is planted in Kangwon and Kyoungbuk, and garlic for warm- region is planted in Kyoungnam, Cheju, and Chonnam. In Chungchong and Chonbuk, both of them are planted. Recently, garlic for cool- region is changing into that of warm- region in Chungchong and Chonbuk due to high productivity and benefit of warm- region garlic. That is to say, yield per 10a of warm- region garlic is higher than that of cool- region one. In addition, price differences between two

**TABLE 2.** Area, Yield and Production by Cultivating Method

	Unit	1995	1996	1997	1998	1999	2000
Area	1,000ha	39.6	42.0	36.3	37.3	42.4	44.9
warm	%	67.4	70.0	71.4	73.0	75.4	78.0
cool		32.6	30.0	28.6	27.0	24.6	22.0
Yield	kg/10a	1,165	1,086	1,085	1,055	1,141	1,056
warm		1,406	1,227	1,251	1,216	1,317	1,220
cool		755	841	777	608	665	736
Production	1,000m/t	461.7	456.0	393.8	393.9	483.8	474.4

Source: MAF, 「Trend and Analysis of Production in 2000」

become less than before, so warm- region garlic becomes more profitable than cool- region one.

Planted area for warm- region garlic accounted for 62% in 1993, but it rose up to 78% in 2000. Recently, planted area is expanding to Taean, Wanju, Hapchon, Youngchon, Samchok.

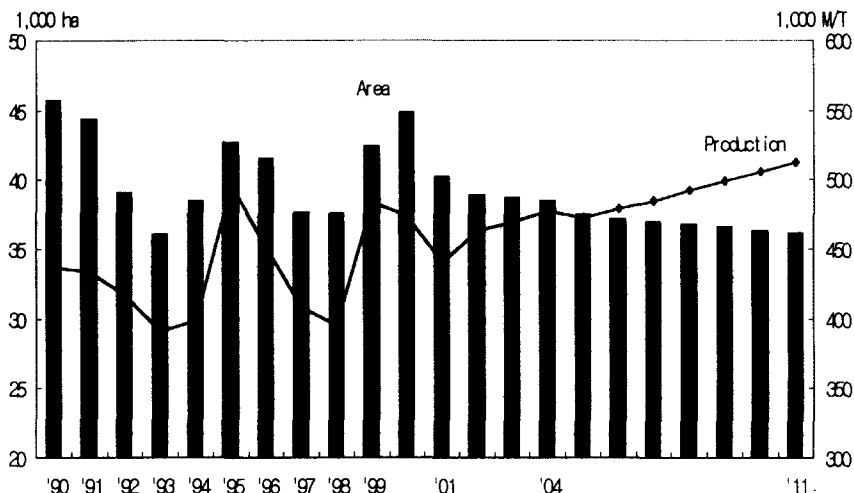
### *1.2. Trend of Supply and Demand*

Korean consumers used 450,000 ton of garlic per year (per capita use; 10kg) in 1995/1996. However, use of garlic fell to 420,000 ~440,000 ton (per capita use; 9.1~9.5kg), due to reduction of yields and recession. In 1999 it rose up 508,000 ton (per capita use; 10.8kg), but lessen consumption caused by slump will likely lead it to decline to 480,000 ton (per capita use; 10.2kg).

## **2. Expectancy of Production and Supply and Demand**

### *2.1. Expectancy of Production*

Planted area in 2001 is expected to be 40,200 ha- down around 11% from a year ago. Reductions will likely be noted in both garlic for warm -region (down 10%) and garlic for cool -region (13%). Considering the estimated yield per 10a, output of garlic

**FIGURE 2.** Projected Area and Production

is forecast to be 441,000 ton- down 7% from the previous year (in 2000) and comparable level to average crop record.

Yield per 10a in 2001 is estimated to be approximately 1,096kg- up 2% from the average annual record- 1,075kg. The reasons are that garlic for cool-region is changing into garlic for warm- region and seed itself is improved better than before by using high-quality sprout.

In the mid/long term, output of garlic will likely increase steady due to rising of yield per 10a, offsetting decreased planted area. Planted area of 2004 is forecast to be 39,000ha, 14% below the year of 2001. Yield per 10a is expected to be 1,238kg and output will likely be 478,000 ton. In 2011 planted area, yield per 10a, and output is expected to be 36,000ha, 1,416kg, and 513,000 ton each.

## 2.2. *Expectancy of Supply and Demand*

Adding yields (440,000 ton), imports (35,000 ton), and brought forward (14,000 ton), supplies are expected to be 490,000 ton in 2001. Use of garlic (excluding carrying forward- 7,000 ton) will likely total 483,000 ton and 10.1kg per person.

Including yields (478,000ton), MMA and imports (20,000 ton), supplies for 2004 is forecast to be 498,000 ton (per capita use; about 10.2kg).

Yields of 2011 will likely be 513,000 ton through rising yield per 10a. Adding yields and 25,000 ton of imports, supplies are expected to be 538,000 ton (per capita use; 10.6kg).

### III. Onion

#### 1. Trend of Production and Supply and Demand

##### 1.1. Trend of Production

Planted area of onion rode a wave from 10,000ha (in the beginning of 1990), to the top of 15,800 ha (in 1995), and hit the bottom of 9,600ha (in 1996). However, it increased continuously since 1996 and became 16,773 ton 4% above a year earlier level.

Early- crop onion is planted in Cheju, Kyoungnam, some parts of Chonnam, and Mid/Late crop onion is planted in Chonnam, Kyoungbuk, Kyoungnam. Onion for Summer is mostly planted in Kangwon, but it is expanding to the heights in Chonbuk and Kyoungnam.

TABLE 3. Area, Yield and Production by Cultivating Methods

	Unit	1995	1996	1997	1998	1999	2000
Area1)	1,000ha	15.8	9.7	12.5	14.8	16.1	16.8
Early	%	14.0	10.7	18.1	15.3	12.4	11.9
Mid/Late	"	86.0	89.3	81.9	84.7	87.6	88.1
Yield	kg/10a	6,162	5,989	5,903	5,891	5,801	5,232
Early	"	5,454	5,311	5,622	5,238	5,575	5,206
Mid/Late	"	6,257	6,032	5,881	6,002	5,864	5,065
Production	1,000ton	974.6	578.5	740.2	872.1	935.8	877.5

1) Include summer crop area (1998 203ha, 1999 310ha, 2000 350ha)  
 Source: MAF, 「Trend and Analysis of Production in 2000」

### *1.2. Trend of Supply and Demand*

In 2001 planted area of onion is expected to be 16,773 ha- up 4%, yield per 10a will likely be 5,232kg- down 10%, and output will be 878,000 ton- down 6%, compared with 1999. Adding 12,000 ton of MMA, 7,000 ton of imports, and yields, supplies are estimated at 897,000 ton.

Consumption of onion remained flat in 1996 due to reduction of output. Since then, rising of yields and strengthening economy supported demand. Use of onion has risen up 0.64 million ton in 1996 (per capita use; 14.1kg), 747,000 ton in 1997 (per capita use; 16.2kg), 888,000 ton in 1998 (per capita use; 19.1kg), 937,000 ton in 1999 (per capita use; 20kg). However, it is estimated at 896,000 ton in 2000 (per capita use; 18.9kg)- slightly decreased compared with the previous year.

## **2. Expectancy of Production and Supply and Demand**

### *2.1. Expectancy of Production*

Planted area in 2001 is expected to be 18,200 ha- up 8% from a year earlier due to reduction of planted area of garlic. Early- crop onion is forecast to rise up 32% from the previous year. The research shows that output of Chonnam will be up 24% and that of Cheju will jump up 42% especially. As for Mid/Late- crop onion, yields are estimated up 5% and especially in Cheju 15%, in Kyoungbuk 9%, in Kyoungnam 4%.

In case of using average yield per 10a (5,863kg), yields of 2001 are estimated at 1.07 million ton- up 21% from a year ago and 28% above average crop record. Therefore, the price of onion will likely remain weak.

Planted area of 2004 is forecast to be 18,500ha and yield per 10a is expected to be 5,950kg up 2% from the average record, and output will likely be 1.1 million ton. In 2011, it is expected that planted area is about 20,000ha, and that yield per 10a is 6,100kg, and that output is 1.2 million ton.

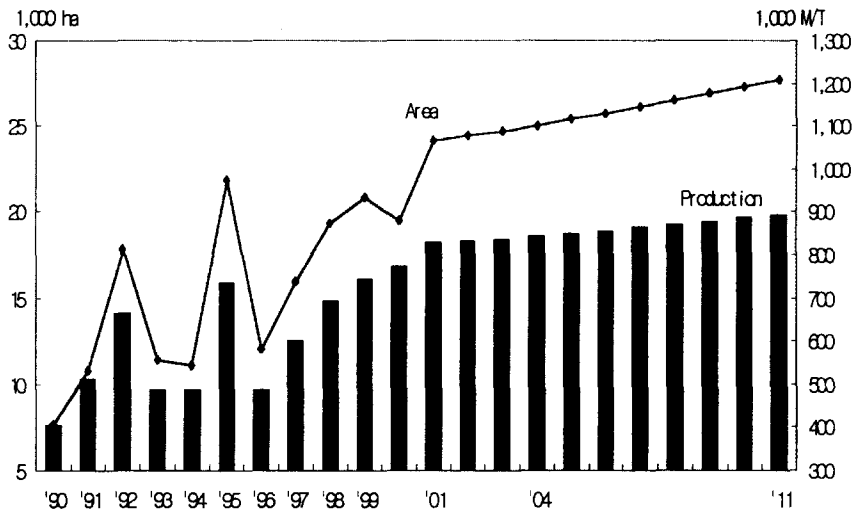


## 2.2. Expectancy of Supply & Demand

Adding yields (1.07 million ton- up 22% from a year earlier) and 18,000 ton of MMA, supplies for 2001 are estimated at 1.09 million ton (per capita use; 22.8kg).

Adding 1.1 million ton of yields and 20,600 ton of MMA, supplies for 2004 are forecast to be 1.12 million and two thousand ton (per capita use; 23kg). Supplies for 2011 are expected to be 1.23 million and four thousand ton adding 1.21 million ton of yields and 26,000 ton of expected imports. Per capita use of onion is forecast to be over 24.3kg.

FIGURE 3. Projected Area and Production

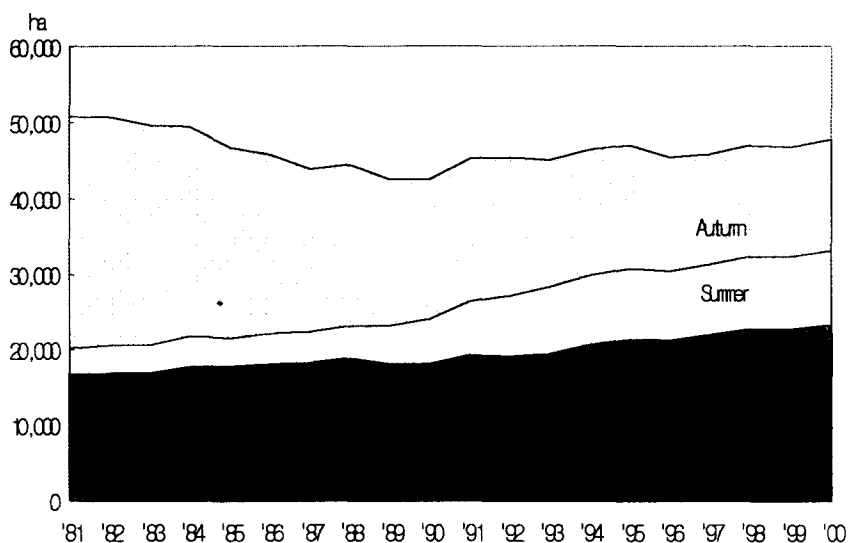


## IV. Chinese cabbage

### 1. Trend of Production

Planted area of Chinese cabbage has fallen by 0.4% per year in 1991/2000. Autumn Chinese cabbage has declined 3.8%, but both

**TABLE 4.** Planted Area by Seasons(5 years moving average)



Spring Chinese cabbage (up 1.6%) and Summer Chinese cabbage (up 5.4%) have risen up. It shows that Chinese cabbage use has been trending toward being constant throughout the year.

Generally, yield per 10a of Chinese cabbage has trended lower. Yield per 10a of Spring Chinese cabbage has increased steady due to rising of green house area since 1990. Yield per 10a of Summer Chinese cabbage had been down due to uncertainty of producing conditions by repeated cultivation before 1996. However, improvement of seed resulted in rising up yield per 10a since 1996. Yield per 10a of Autumn Chinese cabbage mounted in the beginning of 1990, but it started to fall since then. Drop in yield per 10a of Autumn Chinese cabbage is the main reason why overall yield per 10a has been decreased in.

**TABLE 5.** Area, Yield and Production

		1985	1990	1995	1996	1997	1998	1999	2000
Area (ha)	Spring	16,596	19,559	21,731	22,216	21,297	22,824	21,718	25,182
	Summer	3,940	4,983	8,742	10,793	8,636	9,043	10,027	10,206
	Autumn	24,372	22,953	16,010	14,999	13,418	14,931	12,929	16,413
	Total	44,908	47,495	46,483	48,008	43,351	46,798	44,674	51,801
Yield (kg)	Spring	3,217	3,231	3,930	3,928	4,141	4,277	4,319	4,400
	Summer	3,793	3,864	3,565	3,222	3,933	3,349	3,826	3,600
	Autumn	9,180	11,105	10,373	11,850	11,036	10,048	9,297	9,849
	Average	6,503	7,103	6,206	6,244	6,234	5,939	5,649	5,970

Source: MAF.

## 2. Changes of Demand and Trend of Use

Per capita use of Chinese cabbage had fallen by 3% per average year from 80's kg to 60's kg during the 1980's. In 1990's, per capita use has fallen by 1% per year and stood at 50's kg. Therefore, it seems that general decreased trend has slowed.

Per capita use of Spring and Summer Chinese Cabbage remained flat until the end of 1980's. Since 1990, it rose up significantly, but it has stayed level after the mid-1990's. In case of Autumn Chinese cabbage, it had decreased constantly from the 1980's, but trend of falling has been relaxed.

Most demand of Chinese cabbage is for making Kimchi. Subtracting natural reduction accounting for 30% and other use

**TABLE 6.** Per Capita Consumption of Chinese Cabbage

		1985	1990	1995	1996	1997	1998	1999	2000(p)
unit: kg									
Spring		13.1	14.7	18.9	19.2	19.2	21.0	20.0	22.0
Summer		3.7	4.5	6.9	7.6	7.4	6.5	8.2	7.8
Autumn		54.8	59.5	38.1	39.0	32.2	32.3	25.7	34.2
Total		71.6	78.7	64.0	65.8	58.8	59.9	53.9	64.0

accounting for 8% from the supplies, consumption of Chinese cabbage for Kimchi is estimated to be 1.73 million ton in 1995 and 1.51 million ton in 1999.

As a ratio of gaining raw Chinese cabbage, let us apply the statistics of Autumn Chinese cabbage (52%), Spring Chinese cabbage (45%), and Summer Chinese cabbage (40%) each. In addition to, let us use the statistics of side ingredients percentage-25%. Considering the figures above, use of Chinese cabbage Kimchi is estimated to be 1.12 million ton (in 1995) and 0.96 million ton (in 1999) each.

Per capita Kimchi use has declined 2.5% per average year during the past two decades (1980~1999). Especially, per capita use of home-made Kimchi has dropped by 6.8 % per average year rapidly. However, purchased processing Kimchi for using at home has jumped up 7.7% per average year during this time.

Consumption of Spring Chinese cabbage was unchanged throughout the 1980's, but its price had a steep drop. That is, supplies has increased continuously while demands remained flat. However, both use and price have increased until the mid-1990's. Since then, consumption stayed level and price remained weak like 1980's due to the same reason. Reduction of Chinese cabbage for winter preparation led to high price transitorily after 1999.

TABLE 7. Estimation of Kimchi Consumption

Unit: 1,000 tons

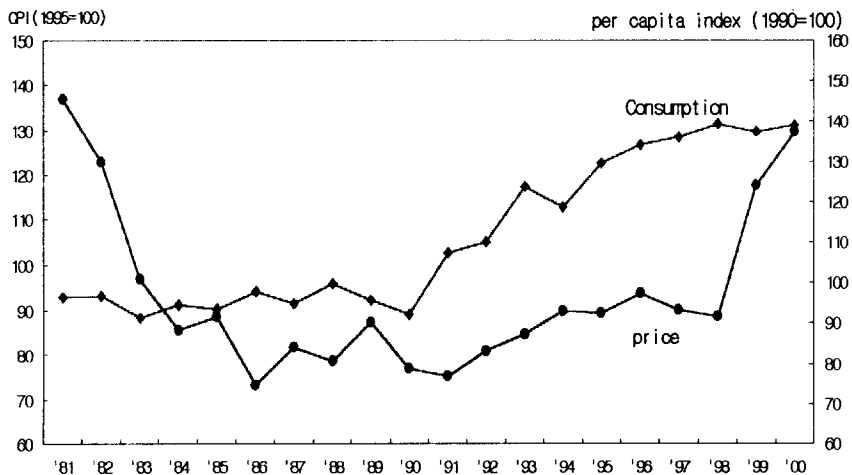
	Cabbage Production	Rate(%)			Cabbage import	Cabbage export	Kimchi Supply	Cabbage Kimchi	Kimchi
		Spring	Summer	Autumn					
1995	2,885	29.6	10.8	59.6	0.07	0.56	1,725	1,118	1,598
1996	2,998	29.1	11.6	59.3	0.03	0.06	1,793	1,161	1,658
1997	2,702	32.6	12.6	54.8	0.05	0.03	1,616	1,039	1,484
1998	2,779	35.1	10.9	54.0	0.03	5.46	1,657	1,066	1,522
1999	2,524	37.2	15.2	47.6	0.35	4.30	1,505	955	1,364

Consumption of Summer Chinese cabbage rose slowly in the early 1980's while its price dropped steeply. This may show that rise of supplies was bigger than that of demands. However, both supply and demand had jumped up in 1986~1995, so it is suggested that both use and price were up. Summer Chinese cabbage use has increased slightly and its price also has been higher since 1996. This shows demand of Summer Chinese cabbage is kind of rising up.

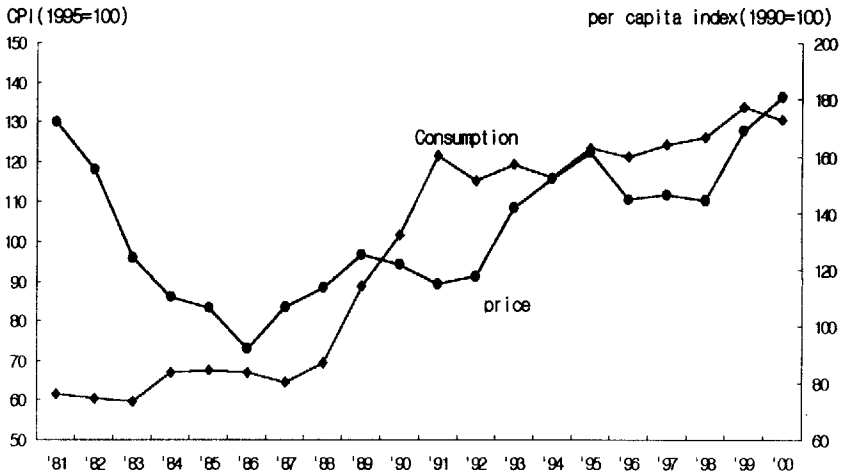
Reductions were noted in both use and price of Autumn Chinese cabbage, so it appears that demand fell sharply in the 1980's. Since the mid-1990's, consumption has declined while price has leaped. This may be the result of large reduction of supply, compared to that of demand.

Overall demand of Chinese cabbage has trended lower since the 1990's. Considering in parts, demand increased in Chinese cabbage for winter preparation, stayed level or slightly increased in Spring and Summer ones, decreased steady in Autumn one.

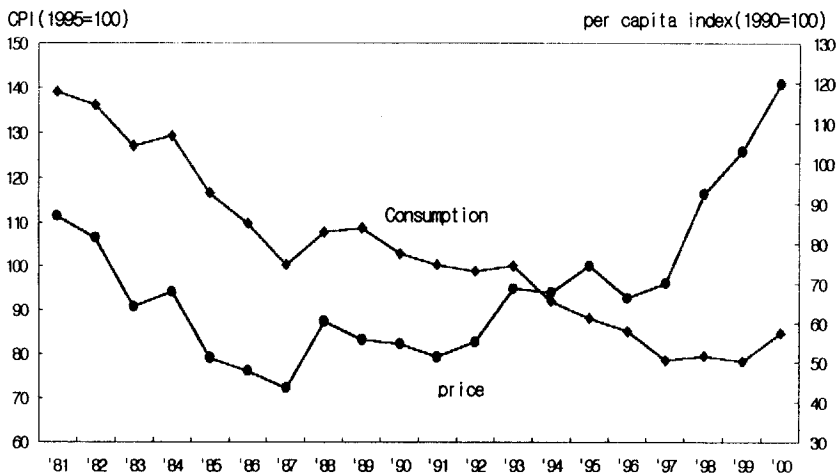
FIGURE 4. Price Fluctuations and Per Capita Consumption of Spring Chinese Cabbage(3 year MA)



**FIGURE 5.** Price Fluctuations and Per Capita Consumption of Summer Chinese Cabbage(3 year MA)



**FIGURE 6.** Price Fluctuations and Per Capita Consumption of Autumn Chinese Cabbage(3 year MA)



### **3. Expectancy of Supply and Demand**

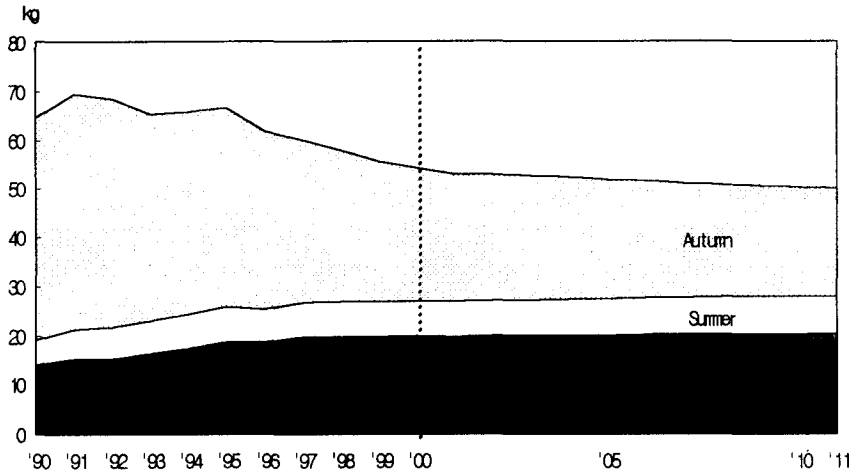
Demands are forecast to remain flat in Spring Chinese cabbage, increase slightly in Summer one, and decrease in Autumn one. According to this, whole demand of Chinese cabbage will likely be slowdown. Per capita use of Chinese cabbage is also expected to be down 0.7% per average year after 2001- 52.2kg (in 2004), 50.0kg (in 2011).

Considering the way of demand, changes in Korea's taste and preferences and in apartment- oriented dwellings will likely contributed to falling demand of raw Chinese cabbage for at-home. However, demand for processing is expected to increase continuously.

Reduction in demands will likely lead to decreasing plated area. According to the way of planting, Chinese cabbage for winter production will rise, Spring one will remain flat due to stood demand. Summer Chinese cabbage and Autumn Chinese cabbage yields are expected to be up slightly and be down each. It is possible that planted area will be ups and downs, according to changes of prices according to the way of planting.

Planted area will likely decline in 2001. Because planted area for winter Chinese cabbage jumped up in 2000, growers having a anxiety about low prices intend to decline about 4% in planted area of Spring Chinese cabbage. In case of delaying the shipment of Winter and Spring Chinese cabbage, the first crop of Summer may be down. Planted area of Autumn Chinese cabbage is forecast to drop steeply due to low prices of the previous year.

**FIGURE 7.** Projections of Chinese Cabbage Consumption per Capita (5 year MA)



**TABLE 8.** Projections of Chinese Cabbage Consumption per Capita

Unit: kg

	Average (1996-99)	2001	2004	2011
Spring	19.5	19.7	19.9	20.5
Summer	7.3	7.3	7.4	8.0
Autumn	32.9	26.4	24.9	21.5
Total	59.7	53.4	52.2	50.0

## V. Radish

### 1. Trend of Production

Planted area of radish has fallen by 0.1% per average year in 1991/2000. Autumn radish has declined 3% per year while Spring radish and Summer radish have risen up 2.1% and 2.5% each.



Yield per 10a of Spring radish stayed level with rises and falls until 1994. However, it has been trending upward steady since 1995. Yield per 10a of Summer radish remained flat until 1992, but it has decreased due to uncertainty of producing conditions by weather changes and repeated cultivation. Recently, it has trended stood. Yield per 10a of Autumn radish had risen up until the early 1990's, but it has trended lower since the mid-1990's.

FIGURE 8. Planted Area by Seasons(5 years moving average)



TABLE 9. Area, Yield and Production

		1985	1990	1995	1996	1997	1998	1999	2000
Area (ha)	Spring	14,216	14,128	17,471	20,564	18,551	18,545	19,050	21,677
	Summer	3,090	2,947	3,523	3,531	3,381	3,426	3,838	3,377
	Autumn	22,703	20,052	14,524	15,627	13,381	15,131	11,875	14,627
	Total	40,009	37,127	35,518	39,722	35,313	37,102	34,504	39,681
Yield (kg)	Spring	2,951	2,889	3,037	3,097	3,248	3,317	3,430	3,300
	Summer	3,305	3,303	2,684	2,670	2,966	2,749	3,046	3,200
	Autumn	5,037	6,259	5,535	6,379	5,684	5,905	5,648	6,033
	Average	4,162	4,742	4,041	4,350	4,143	4,319	4,145	4,299

Source: MAF.

## 2. Changes of Demand and Trend of Use

Per capita radish use had fallen by 2.3% per average year in 1980's and by 1.4% per average year in 1990's to about 30 kg. Reduction trend became slow recently.

Use of Spring and Summer radish remained flat in 1980's, but it has risen up slowly since 1992. Especially, it appears that use of Spring radish has been up 3% per average year. Use of Autumn radish has declined 5% per average year though reduction trend became slow.

Reductions were noted in both use and prices of Spring radish owing to demand down and supply up until the mid-1990's. Since the mid-1990s, lack of supplies led to high prices though use stayed level. Both consumption and prices rose up in 1990~1995. This shows both demand and supply increased. Since 1995, its use has stayed level while prices have been lower slightly. Namely, demand remained flat but supplies rose. Since 1999, prices jumping-up seems transitory phenomenon due to reduction of supplies by weather changes.

Consumption of Summer radish was unchanged since the 1990's, after rising in the early-1980's and falling in the mid-late 1980's. On the other side, its price has continuously been up with ups and downs after steady falling. Therefore, it seems that the price of Summer radish becomes higher due to shortage of supplies (compared with demand) and changes of price under the uncertainty of supplies.

TABLE 10. Per Capita Consumption of Radish

Unit: kg

	1985	1990	1995	1996	1997	1998	1999	2000(p)
Spring	10.3	9.5	11.8	14.0	13.1	13.3	13.7	14.8
Summer	2.5	2.3	2.2	2.1	2.2	2.0	2.5	2.3
Autumn	28.0	29.3	17.8	21.9	16.5	19.2	14.1	14.2
Total	40.8	41.1	31.8	37.9	31.8	34.5	30.2	35.4

FIGURE 9. Price Fluctuations and Per Capita Consumption of Spring Radish(3 year MA)

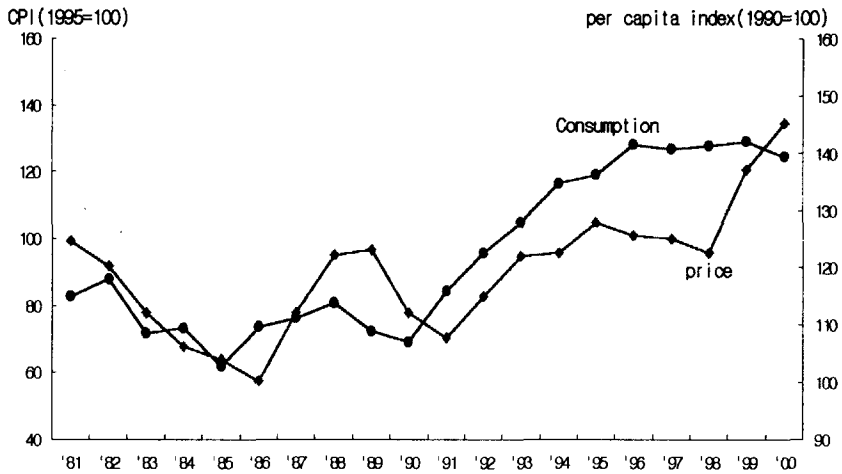
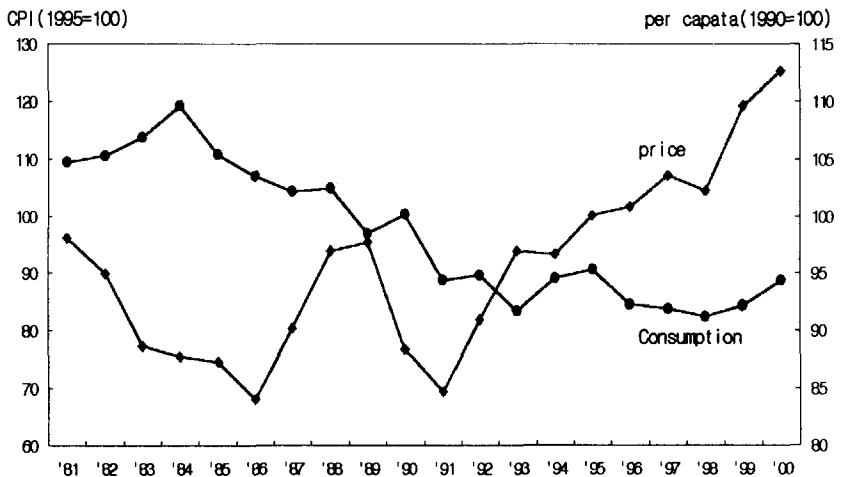
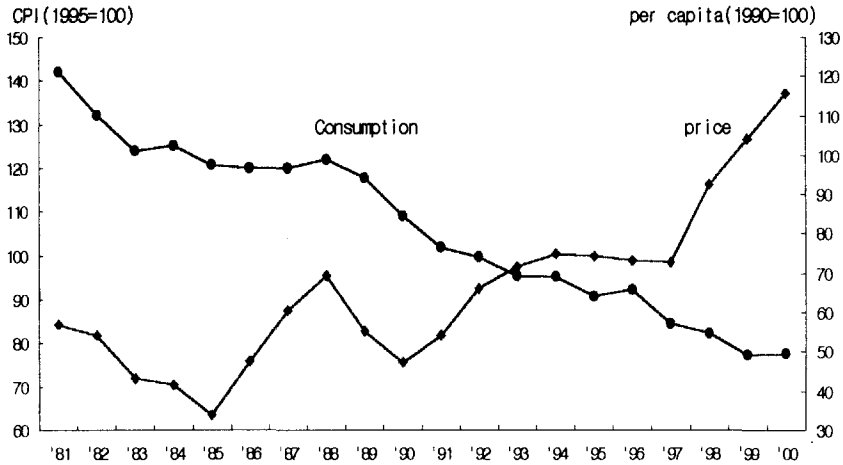


FIGURE 10. Price Fluctuations and Per Capita Consumption of Summer Radish(3 year MA)



**FIGURE 11.** Price Fluctuations and Per Capita Consumption of Autumn Radish(3 year MA)



Consumption of Autumn radish has decreased continuously since 1980's, while its price has been up since the mid-1980's. This shows that supplies of Autumn radish dropped steeper than demands did led to higher prices.

Overall demand of radish has trended lower since the 1980's continuously. Considering in parts, demand stayed level in Spring and Summer radish, has trended downward in Autumn radish.

### 3. Expectancy of Supply and Demand

Demands are forecast to change increasing into staying in Spring radish, continue to stay level in Summer radish, and decrease slowly in Autumn radish. According to this, whole use of radish will likely be down 0.7% per average year since 2001. Estimated per capita radish use will be 29.6kg in 2004, and 29.0kg in 2011.

Considering the way of demand, changes in Korea's taste and preferences and in apartment- oriented dwellings will likely contributed to falling demand of raw radish for at-home.

However, demand for processing (for Kimchi) is expected to increase continuously due to rising demand of purchased processing Kimchi.

Overall planted area will likely decrease due to staying level in demands of Spring and Summer radish and reducing demand of Autumn one. It is possible that planted area will be ups and downs, according to changes of prices according to the way of planting.

FIGURE 12. Projections of Radish Consumption per Capita (5 year MA)

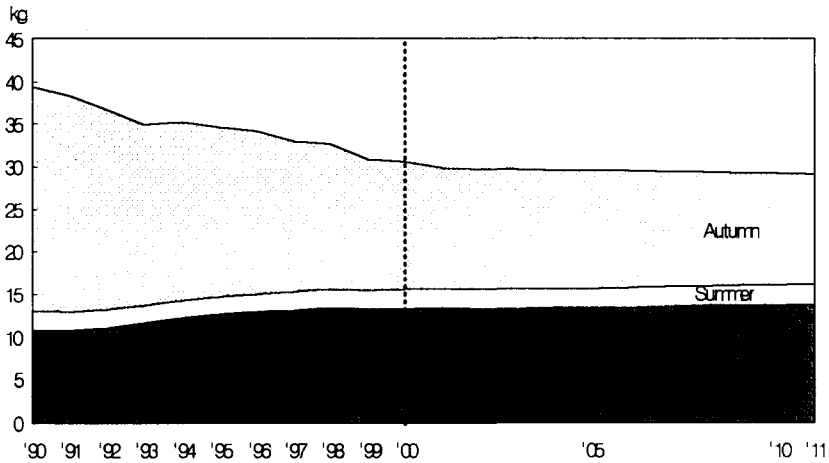


TABLE 11. Projections of Chinese Cabbage Consumption per Capita

Unit: kg

	Average (1996 ~ 99)	2001	2004	2011
Spring	13.2	13.2	13.3	13.8
Summer	2.1	2.3	2.3	2.4
Autumn	17.6	14.2	14.0	12.8
Total	32.9	29.7	29.6	29.0