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## **Korea - Republic of**

**Post:** Seoul

### **North Korea Food Grain Situation in MY 2015-2016**

**Report Categories:**

Agricultural Situation

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**Report Highlights:**

Based on data from the Democratic People's Republic of Korea (DPRK) and United Nations agencies, the estimated net deficiency in food grains and other crops on a grain equivalent basis (potatoes and soybeans) increased dramatically from 29,000 metric tons in marketing year (MY) 2014/15 (November/October) to 392,000 metric tons in MY 2015/16. This estimated net shortage was primarily a result of lower rice production caused by drought and a continued trend in decreasing imports. Despite the food grain deficiency, food prices have remained relatively stable, which suggests the numbers here may not show a complete picture of food availability, as the total cross-border trade with China is difficult to estimate. While flooding occurred in August 2016, the effects will be seen in the potato crop for MY 2016/17. Although United Nations sanctions do not prohibit grain trade or humanitarian aid, the perceived increase in difficulty in doing business within the country has greatly limited the willingness of exporters and donors to focus on the North Korean market.

## **General Information:**

### **Production**

On April 27, 2016 the World Food Program (WFP) released data covering staple food production in the Democratic People's Republic of Korea (DPRK) for marketing year (MY) 2015/16 (November/October). This data was based on calendar year 2015 official fall harvest estimates and 2016 early season crop production estimates by the DPRK Ministry of Agriculture (MoA) as well as 2015 crop production estimates of sloping lands and kitchen gardens (grown in upland areas) by the WFP and the Food and Agriculture Organization of the United Nations (FAO). DPRK food production is generally managed by the government on state-owned property. However, upland food production is managed by private individuals looking to supplement their incomes.

In MY 2015/16, total production of grain and other crops on a grain equivalent basis (potatoes and soybeans) reached an estimated 5.42 million metric tons (in cereal equivalent basis for potatoes and paddy basis for rice), down 9.2 percent from the previous marketing year. Sharply declining rice production after a severe drought in the planting season of 2015 (April – June 2015) accounts for most of this total decline (see table 2).

Low precipitation in 2014 culminated in a severe drought during the 2015 planting season and a shortage of water for irrigation, and led to an 11 percent reduction in harvested rice area from the previous year. As a result, total rice production was down 26 percent from the previous year, amounting to only 1.95 million metric tons (paddy rice basis). The drought especially impacted irrigated rice planting in the important production areas of South Hwanghae and North Hwanghae provinces, resulting in a 23 percent decline in harvested rice area in both provinces (see figure 1 & table 1).

Planted area for corn increased after land suffering from drought was converted from rice to corn cultivation. However, despite an increase in corn planted area of five percent over the previous year, corn production in the government-owned collective farms was estimated at 2.29 million metric tons, down 2.6 percent from the previous year due to dry weather.

Drought-afflicted irrigated rice land was also converted to other crops. This increase in available arable land led to an estimated increase in production of soybeans and other crops such as sorghum, millet and buckwheat.

MoA and FAO both forecast the production of 2016 summer crops on government-managed lands at around 363,000 metric tons, 35 percent higher than the 2015 summer harvest (see table 2). The 2016 summer crop projections include 297,000 metric tons of potatoes (cereal equivalent) and 66,000 metric tons of wheat and barley. Severe flooding along the Tumen River in July 2016 did not impact MY2015/2016 potato production, as this data includes harvests in November 2015 and June 2016. However, the flooding is expected to have severely impacted potatoes produced in the North Hamyong province that were harvested in November 2016. As data becomes available, the flooding and its impacts and will be discussed further in future GAIN reports.

FAO forecasts that in MY 2015/16 crop production outside of government management decreased from the previous year to 203,000 metric tons of corn from sloping lands (terraced upland) farming and 75,000 metric tons from household gardens (50,000 tons of potatoes (cereal equivalent) and 25,000 MT of corn).

Figure 1

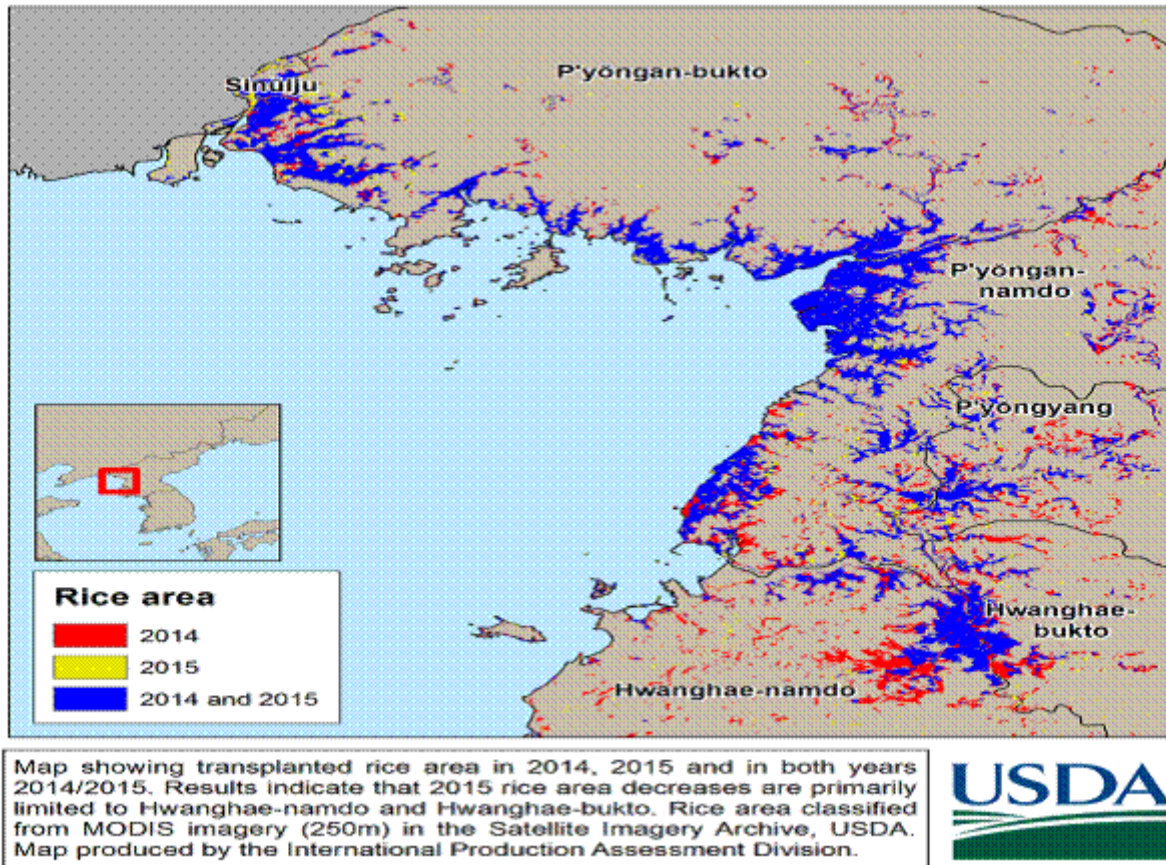


Table 1

DPRK: 2015 Paddy Rice Crop Production				
Province	Planned Area (HA)*	Harvested Area (HA)	Yield (Paddy, Kg/HA)	Production (MT, Paddy)
Pyongyang	15,045	13,000	5,731	74,500
South Pyongan	84,234	74,100	5,532	409,900
North Pyongan	104,084	97,000	4,920	477,200
Chagang	6,284	5,900	4,712	27,800
South Hwanghae	144,500	121,900	3,081	375,600
North Hwanghae	48,889	27,200	2,871	78,100
Kangwon	27,856	21,800	3,592	78,300
South Hamgyong	60,372	54,500	4,206	229,200
North Hamgyong	23,402	26,000	4092	106,400
Ryangyang	1,412	1,300	3,000	3,900
Nampo	27,420	22,600	3,765	85,100
<b>Total</b>	<b>543,498</b>	<b>465,200</b>	<b>4,183</b>	<b>1,945,800</b>

Source: Ministry of Agriculture (MoA, DPRK)

\*Planned area refers to land originally designated for rice production, but may include land that was not actually planted with rice.

Table 2

DPRK: Food Crops Production (1,000 Hectare, 1,000 Metric Tons)						
Marketing Year	MY 2013/2014 (November/October)		MY 2014/2015 (November/October)		MY 2015/2016 (November/October)	
Commodity	Area	Production	Area	Production	Area	Production
Rice, Paddy	547	2,901	525	2,626	465	1,946
Corn	527	2,002	532	2,349	560	2,288
Others (wheat and other grains)	26	66	26	54	45	156
Potatoes <sup>a/</sup>	29	135	28	158	32	168
Soybeans	116	163	143	160	159	222
<b>Fall Harvest Sub Total</b>	<b>1,245</b>	<b>5,267</b>	<b>1,254</b>	<b>5,347</b>	<b>1,261</b>	<b>4,780</b>
Wheat and Barley	54	53	44	36	47	66 <sup>b/</sup>
Potatoes <sup>a/</sup>	122	290	100	233	126	297 <sup>b/</sup>
<b>Summer Harvest Sub Total</b>	<b>176</b>	<b>342</b>	<b>144</b>	<b>269</b>	<b>173</b>	<b>363<sup>b/</sup></b>
<b>National Total</b>	<b>1,421</b>	<b>5,609</b>	<b>1,398</b>	<b>5,616</b>	<b>1,434</b>	<b>5,143</b>
Sloping Land <sup>c/</sup>	550	220	550	220	550	203
Household Gardens <sup>d/</sup>	25	75	25	75	25	75
<b>Grand Total</b>	<b>1,996</b>	<b>5,909</b>	<b>1,973</b>	<b>5,911</b>	<b>2,009</b>	<b>5,421</b>

Source: WFP/FAO

a/ On a 4:1 cereal equivalent basis

b/ Projection to harvest in summer 2016

c/ Corn grown in the upland areas

d/ Composed of 50,000 MT of potatoes and 25,000 MT of corn

Table 3

DPRK: Comparison between Projection and Production of Summer Harvest Crops (1,000 Metric Ton)						
Marketing Year (Nov./Oct)	MY 2013/14		MY 2014/15		MY 2015/16	
Commodity	Projection	Production	Projection	Production	Projection	Production
Wheat and Barley	105	53	60	36	66	Na
Potatoes	316	290	241	233	297	Na
Total	421	342	301	269	363	Na
Accomplishment (%)	81		89		Na	

Source: WFP/FAO

Projections are made during the fall season before planting. Production numbers are made available after harvesting in the spring.

Table 4

DPRK: Grain/Staple Food Production in Cereal Equivalent (1,000 MT, milled)							
Marketing Year (Nov/Oct)	Grand Total	Soybeans <sup>5/</sup>	Potatoes <sup>1/</sup>	Grains			
				Total	Rice <sup>2/</sup>	Corn <sup>3/</sup>	Others <sup>4/</sup>
2010/11	4,251	185	469	3,597	1,601	1,858	138
2011/12	4,475	294	324	3,857	1,635	2,102	120
2012/13	4,821	202	430	4,189	1,769	2,285	135
2013/14	4,952	196	475	4,281	1,915	2,247	119
2014/15 (A)	5,050	192	441	4,433	1,733	2,594	90
2015/16 (B)	4,803	266	515	4,022	1,284	2,516	222
Change (B-A)	-247	-74	+74	-411	-449	-78	+132

Source: WFP/FAO

1/ Potatoes are measured on a 4:1 cereal equivalent basis

2/ Milled basis with 66 percent of paddy to rice milling rate 3/ includes corn production from sloping land and household gardens 4/ Other grains such as wheat, barley, sorghum and millet 5/ cereal equivalent using a factor of 1.2

Table 5

DPRK: Fertilizer Supply Status for 2008-2015 (Metric Tons)					
Year	Domestic Production	Import/ Assistance	Carried- Over Stocks	Application	Ending Stocks

2008	274,640	181,157	1,400	456,297	900
2009	181,266	266,817	900	445,983	3,000
2010	198,066	299,250	3,000	498,816	1,500
2011	199,357	548,108	1,500	745,965	3,000
2012	243,041	483,586	3,000	726,627	3,000
2013	na	na	na	707,199	na
2014	na	na	na	749,670	na
2015	na	na	na	622,606	na

Source: North Korean Ministry of Agriculture, WFP/FAO Report (2014)

Table 6

DPRK: Fertilizer Imports from China for 2008-2016 (Metric Tons)					
Year	Jan-Mar	Apr-Jun	Jul-Sep	Oct-Dec	Total
2008	7,098	14,390	6,442	3,703	31,633
2009	27,553	31,420	46,534	480	105,987
2010	40,677	58,911	183,444	4,271	287,303
2011	25,467	164,979	164,317	324	355,087
2012	6,531	207,343	38,278	638	252,790
2013	28,725	110,436	46,408	21,765	207,334
2014	69,085	40,446	6,007	26,510	142,048
2015	16,684	30,978	22,235	1,084	70,981
2016	148,654	3,576	na	na	152,230

Source: (Korea International Trade Association) KITA, Global Trade Atlas (GTA)

### Consumption

For MY 2015/16 (Nov/Oct), WFP/FAO estimated that total DPRK utilization of grain and other crops on a grain equivalent basis was 5.50 million tons. Converting total domestic crop production into grain equivalent yields 4.8 million metric tons, which consists of 1.3 million metric tons of milled rice, 2.5 million metric tons of corn, 0.52 million tons of potatoes (cereal equivalent), 0.27 million metric tons of soybeans (cereal equivalent) and 0.2 million metric tons of other grains. Therefore, the estimated gap between production and utilization is 692,000 metric tons. As expected DPRK imports were only 300,000 metric tons during this marketing year, the unmet deficit of food grains is estimated to be 392,000 metric tons (see table 7). This shortage is significantly greater than the shortage of 29,000 metric tons in MY 2014/15. While this shortage is significant, food prices in the DPRK have remained stable as marketization has taken hold in the country. The stability of prices, along with the difficulty of estimating true trade across the DPRK-China border, leads Post to conclude that the grains shortage reported here may be being tempered by movement of foods and money throughout the country.

Table 7

DPRK: Food Balance Sheet (November/October, 1,000 MT)				
Marketing Year	MY2012/13	MY2013/14	MY2014/15	MY2015/16
<b>Production, Total (A)</b>	<b>4,821</b>	<b>4,952</b>	<b>5,050</b>	<b>4,803</b>
Rice <sup>1/</sup>	1,769	1,915	1,733	1,284
Corn <sup>2/</sup>	2,285	2,247	2,594	2,516
Wheat/Barley	76	53	36	66
Other Grains	59	66	54	156
Potatoes <sup>3/</sup>	430	475	441	515
Soybeans <sup>4/</sup>	202	196	192	266
<b>Utilization, Total (B)</b>	<b>5,291</b>	<b>5,370</b>	<b>5,489</b>	<b>5,495</b>
-Food	4,298	4,315	4,341	4,383
-Feed	120	120	120	120
-Seed	210	209	225	238
-Loss	663	726	803	754
<b>Balance (A-B)</b>	<b>-470</b>	<b>-418</b>	<b>-439</b>	<b>-692</b>
<b>Import</b>	<b>330</b>	<b>300<sup>5/</sup></b>	<b>410<sup>5/</sup></b>	<b>300<sup>5/</sup></b>
<b>Shortage</b>	<b>-140</b>	<b>-118</b>	<b>-29</b>	<b>-392</b>

Source: WFP/FAO

1/ Milled basis with 66 percent of paddy to rice milling rate 2/ includes corn production from sloping land and household gardens 3/ Potatoes are measured on a 4:1 cereal equivalent basis 4/ cereal equivalent using a factor of 1.2

5/ Forecast commercial imports including food aid

Table 8

DPRK: Food Balance Sheet for MY 2015/16 (November/October, 1,000 MT)							
Commodity	Rice <sup>1/</sup>	Corn	Wheat/ Barley	Others	Potatoes <sup>2/</sup>	Soybeans <sup>3/</sup>	Total
<b>Total Supply</b>	<b>1,284</b>	<b>2,516</b>	<b>66</b>	<b>156</b>	<b>515</b>	<b>266</b>	<b>4,803</b>
Fall Harvest	1,284	2,288	-	156	168	266	4,162
Summer Harvest	-	-	66	-	2297	-	363
Slope Farm (Upland)	-	203	-	-	-	-	203
Garden Farm (Upland)	-	25	-	-	50	-	75
<b>Total Use</b>	<b>1,705</b>	<b>2,654</b>	<b>182</b>	<b>165</b>	<b>515</b>	<b>275</b>	<b>5,495</b>
Food	1,455	2,052	156	133	336	251	4,383
Feed	-	100	-	-	20	-	120
Seed	50	74	16	7	81	22	238
Loss	200	428	11	26	77	13	754
<b>Deficiency</b>	<b>421</b>	<b>138</b>	<b>116</b>	<b>9</b>	<b>0</b>	<b>11</b>	<b>694</b>
Imports <sup>4/</sup>	-	-	-	-	-	-	300

Net Deficiency	-	-	-	-	-	-	394
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Source: WFP/FAO

1/ Applicable paddy to rice milling rate at 66 percent

2/ Cereal equivalent at 25 percent

3/ Cereal equivalent at 120 percent

4/ Forecast

## Imports & Humanitarian Aid

In CY 2015, DPRK imported 107,000 metric tons of food grains in the form of commercial imports and food aid. Commercial imports totaled 79,000 metric tons, consisting mainly of wheat flour, corn, rice and soybeans from China and Ukraine. Food aid was primarily given as multilateral food assistance from WFP/FAO (see Table 9), and totaled 28,204 metric tons.

In CY 2016, total reported food grain imports including food aid are forecast at only 100,000 metric tons. This number is significantly lower than the number of forecast imports (table 8) because it represents only the official reported number. One major change that has been taking place in recent years is an increase in marketization of North Korea, which has led to more trade in grains in an unofficial capacity.

The decrease in both food aid and commercial imports may have been caused inadvertently by tightening UN sanctions policies. While commercial food trade and humanitarian aid are not restricted by current sanctions, humanitarian agencies have reported that banks are reluctant to make money transfers to North Korea, and shipments of humanitarian goods are sometimes blocked. The perception that these types of difficulties are inevitable has also prevented would-be donors from contributing.

Despite these constraints, in recent years the DPRK has increased marketization of commodities and developed a distribution industry. These changes have resulted in a more competitive market with relatively stable prices. Commodities are able to move relatively unimpeded from the border region to other areas throughout the country. These market forces, combined with high demand for food coming from China that may not be reflected in official trade numbers, suggest that the food deficit in the DPRK may not be as great as the numbers here imply.

Table 9

DPRK: Estimated Grains <sup>1/</sup> Import by Origin (Unit: 1,000 Metric Tons)											
Commercial Imports								Food Aid			
Cal. Year	China	Russia	USA	Ukraine	Australia	Brazil	Sub Total	Others <sup>2/</sup>	Korea		Grand Total
									Gov	Private	
2009	204	2	0	0	0	15	221	31	0	0	253
2010	314	0	7	0	0	0	321	37	0	0	358
2011	376	60	0	0	21	0	457	408	0	0	865
2012	282	1	0	0	0	0	283	400	0	0	683
2013	298	0	0	4	0	27	329	102	0	0	427



2014	161	46	0	12	0	0	219	65	0	0	272
2015	48	3	0	28	0	0	79	28	0	0	107
2016	35	7	0	14	0	0	56	27	0	0	83
a/											

Source: Global Trade Atlas (GTA); Data based on export data from supplying countries; WFP/FAO; KOTRA

1/ includes wheat flour and pulses.

2/ 'Others' includes grains supplied through international organizations such as WFP on marketing year (November/October) basis.

a/ January – September. Note that this import number is different from that in Table 8 due to different reporting periods (MY versus FY) and different sources used.

Table 10

DPRK: Food Grain and Oilseeds Import from China (Calendar year, Metric Ton)						
Commodity	2011	2012	2013	2014	2015	2016 <sup>a/</sup>
Wheat	0	0	0	0	0	0
Rye	0	0	0	0	0	0
Barley	1	600	0	1	0	0
Oats	0	0	0	0	0	0
Corn	135,751	54,444	76,572	15,658	9,891	1,758
Rice	92,242	49,010	49,528	63,884	17,138	30,169
Sorghum	0	0	0	24	0	0
Others	3,302	637	960	720	120	0
<b>Subtotal, Grains</b>	<b>231,296</b>	<b>104,691</b>	<b>127,060</b>	<b>80,287</b>	<b>27,149</b>	<b>31,927</b>
Wheat Flour	124,963	157,704	155,886	78,967	14,437	3,022
Soybeans	20,171	19,236	15,311	2,019	6,015	147
<b>Grand Total</b>	<b>376,430</b>	<b>281,631</b>	<b>298,257</b>	<b>161,273</b>	<b>47,601</b>	<b>35,096</b>

Source: Global Trade Atlas, China Customs

a/ January - September

## Appendix

Table 11

DPRK: Grain/Staple Food Production (1,000 MT)							
Crop Year	Grand Total	Beans <sup>1/ 5/</sup>	Potatoes <sup>1/</sup>	Grains			
				Total	Rice <sup>2/</sup>	Corn <sup>3/</sup>	Others <sup>4/</sup>
1985	5,311	535		4,776	2,113	2,536	127
1986	5,939	545		5,394	2,387	2,864	143
1987	5,575	560		4,015	2,219	2,663	133
1988	5,376	565		4,811	2,129	2,554	128
1989	5,516	565		4,951	2,142	2,680	129
1990	4,861	565		4,296	1,800	2,380	116
1991	4,427	207	373	3,847	1,641	2,120	86

1992	4,268	218	312	3,738	1,531	2,112	95
1993	3,884	197	312	3,375	1,317	1,963	95
1994	4,125	173	240	3,712	1,502	2,138	72
1995	3,451	129	158	3,164	1,211	1,851	102
1996	3,690	121	147	3,420	1,340	1,976	106
1997	3,489	112	145	3,232	1,503	1,599	130
1998	3,886	113	154	3,619	1,461	1,947	211
1999	4,220	120	310	3,780	1,630	1,920	230
2000	3,590	123	390	3,090	1,425	1,440	212
2001	3,946	88	437	3,421	1,680	1,588	153
2002	4,130	100	450	3,580	1,730	1,640	210
2003	4,250	100	470	3,680	1,720	1,710	250
2004	4,310	130	450	3,730	1,800	1,670	260
2005	4,540	170	470	3,900	2,020	1,630	250
2006	4,480	160	450	3,870	1,890	1,750	230
2007	4,010	150	470	3,390	1,530	1,590	270
2008	4,310	160	510	3,640	1,860	1,540	240
2009	4,110	150	530	3,430	1,910	1,300	220
2010	4,251	185	469	3,597	1,601	1,858	138
2011	4,475	294	324	3,857	1,635	2,102	120
2012	4,821	202	430	4,189	1,769	2,285	135
2013	4,952	196	475	4,281	1,915	2,247	119
2014	5,050	192	441	4,433	1,733	2,594	90
2015	4,803	266	515	4,022	1,284	2,516	222

Source: USDA prior to CY 1990; Ministry of Unification, Rural Development Administration since from CY 1990 to 2009; WFP/FAO since CY 2010

1/ USDA data for CY 1985-1990 is for "millet" but is believed to include potatoes and beans. Potatoes are measured on a 4:1 grain equivalent basis.

2/ Milled basis.

3/ includes corn production from sloping land and household gardens since CY 2010

4/ Other grains such as wheat, barley, sorghum, millet and buckwheat

5/ cereal equivalent using a factor of 1.2 since CY 2010

Table 12

DPRK: Rice Acreage, Yield and Production (Milled)			
Crop Year	Acreage (1,000 HA)	Yield (MT/HA)	Production (1,000 MT)
1991	614	2.81	1,641
1992	614	2.68	1,531
1992	614	2.32	1,317
1994	585	2.64	1,502
1995	585	2.07	1,211
1996	580	2.31	1,340
1997	576	2.61	1,503

1998	576	2.54	1,461
1999	580	2.81	1,630
2000	545	2.61	1,425
2001	572	2.94	1,680
2002	576	3.00	1,730
2003	582	2.96	1,720
2004	582	3.09	1,800
2005	584	3.46	2,020
2006	586	3.23	1,890
2007	587	2.60	1,530
2008	587	3.17	1,860
2009	587	3.26	1,910
2010	570	2.77	1,577
2011	571	2.81	1,610
2012	563	3.14	1,769
2013	547	3.55	1,915
2014	525	3.30	1,733
2015	465	2.76	1,284

Source: Ministry of Unification (MOU), Rural Development Administration (RDA) from CY 1991 to 2009; WFO/FAO since CY 2010.

Table 13

DPRK: Corn Acreage, Yield and Production			
Crop Year	Acreage (1,000 HA)	Yield (MT/HA)	Production (1,000 MT)
1991	670	3.16	2,120
1992	660	3.20	2,112
1992	650	3.02	1,963
1994	650	3.29	2,138
1995	650	2.85	1,851
1996	600	3.29	1,976
1997	641	2.49	1,599
1998	629	3.10	1,947
1999	570	3.37	1,920
2000	543	2.65	1,440
2001	543	2.93	1,588
2002	527	3.11	1,639
2003	526	3.25	1,710
2004	526	3.17	1,670
2005	526	3.10	1,630
2006	526	3.33	1,750
2007	526	3.02	1,590
2008	526	2.89	1,540

2009	526	2.48	1,300
2010	503	3.35	1,683
2011	503	3.70	1,857
2012	531	3.80	2,040
2013	527	3.80	2,002
2014	532	4.42	2,349
2015	560	4.09	2,288

Source: Ministry of Unification (MOU), Rural Development Administration (RDA) from CY 1991 to 2009; WFO/FAO since CY 2010, which doesn't include corn production from sloping land and household gardens.

Table 14

DPRK: Estimated Grain <sup>1/</sup> Imports by Origin (Unit: 1,000 Metric Ton)												
Cal Year	Commercial Imports								Food Aid			
	Chi na	Syri a	Thaila nd	Cana da	Japa n	E U	Braz il	Sub Tot al	Other s <sup>1</sup>	Korea		Gran d Tota l
										Gov	Priva te	
1991	300	0	90	350	0	0	na	740	550	0	0	1,290
1992	620	0	20	80	0	0	na	720	110	0	0	830
1992	740	0	78	160	0	0	na	978	115	0	0	1,093
1994	305	0	52	0	0	0	na	357	133	0	0	490
1995	153	0	162	0	370	0	na	685	277	15	4	1,117
1996	547	140	30	0	132	11	na	964	301	0	0	1,265
1997	867	34	38	0	0	82	na	1,021	576	0	80	1,677
1998	288	104	0	0	59	20	na	471	579	0	77	1,127
1999	238	61	0	0	0	40	na	339	751	0	9	1,099
2000	283	0	284	0	106	22	na	695	512	0	0	1,207
2001	436	5	0	0	500	0	553	1,494	437	0	0	1,931
2002	219	0	200	0	0	0	52	471	586	35	0	1,415
2003	349	0	95	51	0	10	76	581	304	44	0	1,327
200	90	0	184	0	0	3	138	415	304	10	0	824

4										5		
2005	327	0	100	14	0	15	0	456	404	400	0	1,260
2006	79	0	2	0	0	0	111	192	19	90	0	301
2007	136	0	212	1	0	0	18	367	30	161	0	558
2008	119	0	14	0	20	0	0	153	129	0	0	282

Source: Korea Trade-Investment Promotion Agency (KOTRA), and Ministry of Unification (MOU).

1/ Excludes grain flours and pulses.

Note: 'Others' includes grains supplied through international organization such as WFP.