

2003 Hay Market and Export Report

William T. W. Woodward¹

According to the USDA National Agricultural Statistics Service, the value of all hay in Washington in 2002 was about \$381 million while the value of alfalfa hay was about \$265 million (Table 1). Among agricultural commodities, hay value ranks sixth in Washington. Alfalfa moved ahead of farm forest products, and now would rank 8th if listed by itself as a crop. Table 2 shows the acreage of the top 10 hay producing counties in the state with Grant and Franklin counties having 40 percent of all hay acres and 41 percent of the alfalfa acreage. In 2002 there were 810 thousand acres of hay harvested with alfalfa making up 490 thousand of those acres (Tables 3 & 4). Alfalfa acreage increased by 4.2% in the state, while all hay acreage increased by 2.5 percent from 2001 to 2002 (Tables 3 & 4). The increased acreage and yield was offset by reduced pricing resulting in only a 1.6% increase in value of all hay. Alfalfa production was offset by a 5.3% reduction in price to yield a 2.7% increase in production value.

Ten-year data for area, yield, production, price per unit, and value of production for Oregon are shown for all hay and alfalfa in Tables 5 and 6, respectively. In Oregon, all hay production was up 11.6% due to increases in acres and yield. Although price softened 5.3%, value of production was up 6.3%. Alfalfa acreage increased significantly by about 15% in 2001 and increased again in 2002 by 3.2%. Due to a 7.6% drop in average price per unit, overall value of production was down 4.7%.

Tables 7 and 8 provide Idaho information for area, yield, production, price per unit, and value of production for all hay and alfalfa, respectively. An increase in acreage of 8.5% with slightly higher yields provided a 14.5% increase in all

¹ Woodward, William T. W., WSU Extension agronomist

hay production for Idaho. Average price per unit dropped 17% offsetting the significant increase in production and reducing the value of production by 5%. Data for alfalfa hay, which makes up 77% of the forage production in Idaho, was the driving force behind the changes in the statistics for all hay.

Washington's average monthly alfalfa prices for the last 10 years are shown in Table 9. In general, there is a trend for prices to be highest during the months of May, June, and July. Average prices for 2002 were strong and stable through June and then softened to a firm level for the rest of the year. This trend is similar to 1997, with 1998 having higher than average prices for the first half of the year and dropping to average during the second half. If the trend continues to mirror 1996 through 1998, prices could soften to average levels beginning in June 2003.

Hay stocks for Washington, Oregon and Idaho are shown in Table 10. Although May 1 hay stocks for 2002 were below or near ten-year averages for the PNW states, the year ended with above average hay stocks. December 1 hay stocks were up 16.5%, 21.2% and 9% for Washington, Oregon and Idaho, respectively. With the mild winter it is expected that 2003 May 1 hay stocks will be higher than average.

Table 11 provides data for area, yield, production, price per unit, and value of alfalfa production for the PNW. The year 2002 provided for 8% more acres for the PNW with slightly higher yields to produce a 10.4% increase in production for alfalfa. Value of production was about \$973 million down 2.9% from 2001 due to an 11% decline in average price. The production value dropped below the billion-dollar mark that was reached in 2001.

Table 12 provides information on area, yield, production, price per unit, and value of production for all hay over five years in the PNW. An increase in acreage and yield sent all hay production up 11.6% to 12.4 million tons. However, a 10% drop in average price offset increased production to yield a value of production of \$1.27 billion, unchanged from 2001. Total hay supplies for the PNW for the last 10 years are shown in Table 13. Due to significantly higher production in 2002 for all three states in the PNW, hay supplies were up 10% from the previous year.

Tables 14,15, and 16 show annual milk production for the three PNW states. Washington's annual milk production continues to grow at a slow pace, the results of higher milk production per cow. Washington is the leading state in

the United States for milk production per cow with 22,753 pounds of milk per cow. Oregon's annual milk production shot up 22% due to an increase of 20% in milk cow numbers. Idaho continues to be a bright spot with production increases climbing 152% since 1993. This was due to a 105% increase in cow numbers and a 23% increase in milk production per cow in the same period of time.

Exports are an important market for the PNW forage producer. Forage products exported from the PNW include alfalfa hay and cubes, timothy, orchardgrass, oat hay, ryegrass and fescue straw. Table 17 shows the Department of Commerce United States export data to the Pacific Rim over six years. This data tends to be slightly lower than what is reported by the US ports and from individual countries. In 2001, the United States exported over 2.2 million metric tons of forage products to the Pacific Rim (Table 17a), which was down 7.4% percent from 2000. Japan's share of the market dropped from 86% to 77.6% in 2000 while Korea's share grew to 16.9% from 8.5%. The percent share remains about the same for 2001 (Table 17a).

While Japan's alfalfa cube imports continue to decline, (Table 18) baled hay imports continue to grow exceeding the two million metric ton mark in 2002 (Table 19). Tables 20 and 21 show Japan's baled hay and cube import by month for 2002. It is interesting to note the drop in imports in October, which was due to the port shutdown. However, it appeared that the shortage was made up by the end of the year. Although not shown in tabular form, the 2003 January imports for alfalfa cubes and baled hay is up 71% over the 2002 January number, indicating potential stock piling. This action is probably due to the port shut down concern and worries about the situation in Iraq. About 75 percent of these hay products for Japan were shipped from the United States with about 13 percent from Canada (Table 22). Seventy-three percent of the pellet imports for Japan are from Canada while the Netherlands has recently taken a 13% share (Table 23). The US has only 7.6% of that market.

Table 24 provides information on Japan's forage imports for 2002. The distribution of the imports for the United States, Canada, and Australia was 70%, 17%, and 11%, respectively. Data provided by the Port of Portland indicates that the PNW share of exports to Japan is 58% or about one million metric tons for 2001 while the PSW is responsible for 42% (Table 25). About 12.2 million metric tons of hay was produced in the PNW in 2002 with about 11.1 in 2001 (Table 26) of which 9% was exported to Japan. Estimates for forage exports from Washington are about 25 percent of the states total hay

production or about 773 thousand metric tons (Table 29a). It is generally accepted that forage exports help support and stabilize forage prices in the PNW.

The west coast forage exports to the Pacific Rim are shown in Table 28. About 1.3 million metric tons of forage were exported from the PNW representing 58% of the total. About 12 percent of the PNW hay is exported to the Pacific Rim (Table 29).

Forage imports for Korea are shown in Tables 30, 31, and 32. Although Korea's import of cubes and pellets has been somewhat stable for the past 10 years, imports of alfalfa baled hay and other baled forage products have increased dramatically. In the last five years, imports of these two product types have increased by 569% to 535 thousand metric tons for 2002.

Table 33 provides annual forage import data for Taiwan. Although the data shows a fairly stable import record for forage products in the last 10 years peaking in the year 2000 at 333 thousand metric tons, the last two years have dropped off by about 33 percent. Market share for the US has continued to grow over the last 10 years to 70% at a cost to Canada and Australia with 2002 market share at 12% and 17%, respectively.

Dairy Farm Changes in Japan

The number of dairy farms in Japan has declined drastically in recent years. The number of farms fell by half in a single decade, from 1980 to 1990, and this decline has since continued. The number of dairy cattle, 99% of which were Holstein, increased until 1980 and thereafter remained stable until the early 90's at 2.0-2.1 million head and has since declined to about the 1975 level of 1.7 million head. The number of cattle per farm has increased greatly. Table 34 shows the number of dairy cattle by size of dairy farm over years while table 35 shows the data in percent. In 1975, 26.6 percent of the farms had 1-9 head while in 2001 only 1.7 percent had this number. The most dramatic change in the number of dairy cattle was in the farms with 30 head or more. Their total inventory increased from 340,000 head in 1975 to 1.4 million head in 2001 which was a change from 19% to 82% over the same period of time.

Milk production per cow in Japan increased from 9,749 pounds in 1975 to 16,318 in 2001 (Table 34). These rapid improvements in milk yield in Japan's Holstein dairy cattle were the result of good breeding and feeding programs.

Over the past ten years, of this annual increase in milk production, about 103 lbs is estimated to be the result of breeding improvements, while improved management contributed 242 lbs for the first lactation and 326 lbs in later lactations. These values indicate that in these annual improvements, management had two to three times the effect of genetic improvement. Table 37 shows similar information for Korea with the similar trend of fewer households and larger number of head per household.

Table 1: 2002 Washington State Hay Value

Crop	\$1,000	Change 2002 vs. 2001
Alfalfa	264,600	2.80%
Other Hay	116,544	-1.35%
All Hay	381,080	1.53%

Source: USDA-NASS

**Table 2: 2001 Hay By County –
1000 Acres**

Rank	County	All Hay	Alfalfa
1	Grant	132.0	119.0
2	Franklin	80.5	75.0
3	Spokane	56.0	37.0
4	Kittitas	53.0	9.0
5	Stevens	48.5	38.5
6	Yakima	42.5	35.0
7	Adams	40.0	31.0
8	Klickitat	35.0	27.0
9	Okanogan	32.0	19.0
10	Lincoln	25.0	14.5

Source: USDA-NASS

Table 3: Washington All Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	750	3.78	2835	98.00	284,580
1994	710	3.92	2785	92.50	268,839
1995	760	4.31	3278	97.00	328,878
1996	800	3.93	3140	115.00	371,347
1997	780	3.95	3084	115.00	361,824
1998	750	4.21	3156	97.00	312,588
1999	740	4.13	3059	98.00	307,027
2000	780	4.17	3249	105.00	354,985
2001	790	3.91	3088	119.00	375,328
2002	810	4.13	3346	112.00	381,080

Source: USDA-NASS

Table 4: Washington Alfalfa Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	480	4.50	2160	95.50	206,280
1994	470	4.70	2209	86.50	191,079
1995	500	5.10	2550	93.00	237,150
1996	490	4.70	2303	110.00	253,330
1997	480	4.80	2304	111.00	255,744
1998	480	5.00	2400	91.50	219,600
1999	470	4.90	2303	89.00	204,967
2000	470	5.00	2350	97.50	229,125
2001	470	4.80	2256	114.00	257,184
2002	490	5.00	2450	108.00	264,600

Source: USDA-NASS

Table 5: Oregon All Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	1040	2.95	3066	97.50	262,794
1994	1010	2.81	2840	99.00	255,480
1995	1100	3.00	3300	99.50	303,615
1996	1070	3.03	3244	104.00	313,336
1997	1035	3.16	3266	117.00	361,020
1998	970	3.48	3374	104.00	337,698
1999	1100	2.92	3208	92.00	286,208
2000	1080	2.79	3018	95.50	279,772
2001	1025	2.98	3052	112.00	336,626
2002	1095	3.11	3407	106.00	357,729

Source: USDA-NASS

Table 6: Oregon Alfalfa Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	420	4.20	1764	101.00	178,164
1994	410	4.00	1640	102.00	167,280
1995	450	4.30	1935	104.00	201,240
1996	460	4.40	2024	109.00	220,616
1997	420	4.70	1974	123.00	242,802
1998	400	4.80	1920	110.00	211,200
1999	420	4.40	1848	96.00	177,408
2000	390	4.20	1638	99.00	162,162
2001	460	4.30	1978	116.00	229,448
2002	475	4.30	2043	107.00	218,601

Source: USDA-NASS

Table 7: Idaho All Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	1330	3.64	4844	81.00	386,904
1994	1250	3.55	4438	83.50	367,651
1995	1400	3.63	5080	87.00	434,785
1996	1280	3.72	4760	96.00	450,240
1997	1300	3.64	4730	105.00	483,110
1998	1430	3.88	5549	83.00	452,316
1999	1430	3.59	5132	83.00	417,788
2000	1390	3.81	5292	94.50	491547
2001	1420	3.48	4938	116.00	565014
2002	1570	3.57	5608	96.50	534,688

Source: USDA-NASS

Table 8: Idaho Alfalfa Hay Production

Year	Area, Yield, Production, Price per Unit, and Value of Production				
	Harvested	Yield	Production	Price per Unit	Value of production
	Acres - thousand	Tons	1000 tons	\$/ Ton	\$1000
1993	1050	4.00	4200	82.00	344,400
1994	1020	3.90	3978	84.50	336,141
1995	1100	4.10	4510	88.00	396,880
1996	1000	4.20	4200	97.00	407,400
1997	1000	4.10	4100	106.00	434,600
1998	1130	4.30	4859	84.00	408,156
1999	1150	4.00	4600	84.00	386,400
2000	1130	4.20	4746	95.00	450,870
2001	1120	3.90	4368	118.00	515,424
2002	1215	4.00	5000	98.00	490,000

Source: USDA-NASS

Table 9: Washington Alfalfa Monthly Prices

Year	Monthly Prices											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	\$/ Ton											
1993	83	84	86	86	92	90	93	90	93	98	99	99
1994	103	101	96	94	93	90	84	86	83	84	88	88
1995	88	87	90	91	93	94	91	90	91	90	89	90
1996	99	95	98	98	108	112	111	106	108	109	107	113
1997	112	116	110	110	112	110	114	113	116	108	114	110
1998	114	109	100	108	101	103	97	94	91	91	86	88
1999	92	84	74	77	90	95	89	84	86	89	88	87
2000	84	88	89	90	92	101	98	98	96	93	98	95
2001	94	97	99	97	105	120	115	112	114	110	110	112
2002	115	117	115	115	116	119	108	106	106	106	100	104

Source: USDA-NASS

Table 10: Washington, Oregon and Idaho Hay Stocks

Year	Washington		Oregon		Idaho	
	May 1	Dec 1	May 1	Dec 1	May 1	Dec 1
	1000 Tons					
1993	148	992	73	1686	292	2955
1994	312	1198	521	1761	678	2263
1995	139	1410	85	2310	222	2794
1996	426	1162	264	2108	660	2285
1997	283	1295	97	1600	286	2743
1998	308	1663	621	2159	520	3329
1999	410	1377	135	2245	777	2617
2000	165	1303	128	1766	257	2400
2001	195	1513	241	1901	265	2568
2002	170	1620	183	2550	444	2972

Source: USDA-NASS

Table 11: PNW Alfalfa Hay Production

Year	State	Area, Yield, Production, Price per Unit, and Value of Production				
		Harvested	Yield	Production	Price per Unit	Value of production
		Acres - thousand	Tons	1000 tons	\$ / Ton	\$1000
1997	ID	1000	4.1	4100	106.0	434600
1997	OR	420	4.7	1974	123.0	242802
1997	WA	480	4.8	2304	111.0	255744
1997	PNW	1900	4.5	8378	113.3	933146
1998	ID	1130	4.3	4859	84.0	408156
1998	OR	400	4.8	1920	110.0	211200
1998	WA	480	5.0	2400	91.5	219600
1998	PNW	2010	4.7	9179	95.2	838956
1999	ID	1150	4.0	4600	84.0	386400
1999	OR	420	4.4	1848	96.0	177408
1999	WA	470	4.9	2303	89.0	204967
1999	PNW	2040	4.4	8751	89.7	768775
2000	ID	1130	4.2	4746	95.0	450870
2000	OR	390	4.2	1638	99.0	162162
2000	WA	470	5.0	2350	98.0	230300
2000	PNW	1990	4.5	8734	96.2	843332
2001	ID	1120	3.9	4368	118.0	515424
2001	OR	460	4.3	1978	116.0	229448
2001	WA	470	4.8	2256	114.0	257184
2001	PNW	2050	4.3	8602	117.3	1002056
2002	ID	1250	4.0	5000	98.0	490000
2002	OR	475	4.3	2043	107.0	218601
2002	WA	490	5.0	2450	108.0	264600
2002	PNW	2215	4.4	9493	104.3	973201

Source: USDA-NASS

Table 12: PNW All Hay Production

Year	State	Area, Yield, Production, Price per Unit, and Value of Production				
		Harvested	Yield	Production	Price per Unit	Value of production
		Acres - thousand	Tons	1000 tons	\$ / Ton	\$1000
1997	ID	1300	3.64	4730	105	483110
1997	OR	1035	3.16	3266	117	361020
1997	WA	780	3.95	3084	115	361824
1997	PNW	3115	3.58	11080	112	1205954
1998	ID	1430	3.88	5549	83	452316
1998	OR	970	3.48	3374	104	337698
1998	WA	750	4.21	3156	97	312588
1998	PNW	3150	3.86	12079	95	1102602
1999	ID	1430	3.59	5132	83	417788
1999	OR	1100	2.92	3208	92	286208
1999	WA	740	4.13	3059	98	307027
1999	PNW	3270	3.55	11399	91	1011023
2000	ID	1390	3.81	5292	95	491547
2000	OR	1080	2.79	3018	95	278772
2000	WA	780	4.17	3249	107	355261
2000	PNW	3250	3.59	11559	97	1106995
2001	ID	1420	3.48	4938	116	565014
2001	OR	1025	2.98	3052	112	333626
2001	WA	790	3.91	3088	120	375328
2001	PNW	3235	3.46	11078	117	1285301
2002	ID	1570	3.57	5608	97	534688
2002	OR	1095	3.11	3407	106	357729
2002	WA	810	4.13	3346	112	381080
2002	PNW	3475	3.60	12361	105	1273497

Source: USDA-NASS

Table 13: PNW Total Hay Supplies

Year	Washington		Oregon		Idaho		PNW		PNW
	May 1	Production	May 1	Production	May 1	Production	May 1	Production	Supply
	1000 tons								
1992	327	2962	384	2440	644	3655	1355	9057	10412
1993	148	2835	73	3066	292	4844	513	10745	11258
1994	312	2785	521	2840	678	4438	1511	10063	11574
1995	139	3278	85	3300	222	5080	446	11658	12104
1996	426	3140	264	3244	660	4760	1350	11144	12494
1997	283	3084	97	3266	286	4730	666	11080	11746
1998	308	3156	621	3374	520	5549	1449	12079	13528
1999	410	3059	135	3208	777	5132	1322	11399	12721
2000	165	3249	128	3018	257	5292	550	11559	12109
2001	195	3088	241	3052	265	4938	701	11078	11779
2002	170	3346	183	3407	244	5608	597	12361	12958

Source: USDA-NASS

Table 14: Annual Washington Milk Production

Year	Annual Milk Production, Milk Cows, and Milk per Cow		
	Production	Milk Cows (Average)	Milk Produced per Cow
	Million lbs	1000 Head	Pounds
1993	4,980	257	19,377
1994	5,203	261	19,935
1995	5,304	264	20,091
1996	5,279	257	20,541
1997	5,305	253	20,968
1998	5,326	248	21,476
1999	5,535	247	22,409
2000	5,593	247	22,644
2001	5,514	247	22,324
2002	5,620	247	22,753

Source: USDA-NASS

Table 15: Annual Idaho Milk Production

Year	Annual Milk Production, Milk Cows, and Milk per Cow		
	Production	Milk Cows (Average)	Milk Produced per Cow
	Million lbs	1000 Head	Pounds
1993	3,229	189	17,085
1994	3,754	208	18,048
1995	4,210	232	18,147
1996	4,735	256	18,496
1997	5,193	272	19,092
1998	5,765	292	19,743
1999	6,453	318	20,292
2000	7,223	347	20,816
2001	7,757	366	21,194
2002	8,155	388	21,018

Source: USDA-NASS

Table 16: Annual Oregon Milk Production

Year	Annual Milk Production, Milk Cows, and Milk per Cow		
	Production	Milk Cows (Average)	Milk Produced per Cow
	Million lbs	1000 Head	Pounds
1993	1,692	100	16,920
1994	1,714	100	17,140
1995	1,677	97	17,289
1996	1,608	93	17,290
1997	1,610	90	17,889
1998	1,583	89	17,787
1999	1,665	89	18,708
2000	1,695	90	18,833
2001	1,717	95	18,074
2002	2,093	114	18,360

Source: USDA-NASS

Table 17: U.S. Forage Exports to Pacific Rim

COUNTRY	JANUARY - DECEMBER QUANTITIES					JANUARY - DECEMBER COMPARISONS		
	1997	1998	1999	2000	2001	2001	2002	%CHNG
Metric Tons								
JAPAN	1685881	1774843	1898406	1861794	1621074	1621074	2020687	24.65
KOREA	104010	68278	153455	387308	362195	362195	449053	23.98
TAIWAN	87008	67105	107851	113751	97620	97620	183512	87.99
OTHER	114421	99657	93114	114571	93368	93368	110314	18.15
TOTAL	1991320	2009883	2252826	2477424	2174257	2174257	2763566	27.1

Data Source: Department of Commerce, U.S. Census Bureau, Foreign Trade Statistics

Table 17a: 2001 U.S. Forage Exports Pacific Rim

Country	1000 Tons (MT)	Percent
Japan	1760	77.9
Korea	379	16.8
Taiwan	116	5.1
Other	4	0.2
Total	2259	100

Source: P.O.P., NHA, & Zen-Noh

Table 18: Annual Alfalfa Cube Imports for Japan

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA	614,859	540,579	528,196	482,712	479,950	428,055	410,159	384,084	357,688	348,624
CANADA	166,904	166,816	189,203	158,003	150,736	143,996	117,950	113,743	94,587	64,358
AUSTRALIA	8,734	7,337	0	2,467	7,977	6,639	927	1,957	4,812	7,610
OTHERS	3,429	6,771	2,411	3,931	11,514	9,384	5,770	2,875	3,970	6,523
TOTAL	793,926	721,503	719,810	647,113	650,177	588,074	534,806	502,659	461,057	427,115

Source: Japan Customs

Table 19: Annual Baled Hay Imports for Japan

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA	1,102,849	1,088,711	1,189,197	1,223,485	1,462,265	1,240,617	1,373,676	1,423,459	1,421,167	1,490,607
CHINA	48,427	63,993	51,101	58,867	69,228	61,167	56,752	15,238	520	616
AUSTRALIA	48,930	61,284	48,098	85,461	115,081	113,913	158,911	182,984	194,946	296,778
CANADA	39,550	60,721	88,074	89,309	104,906	138,716	149,502	184,283	214,316	233,298
OTHERS	4,860	6,828	7,324	4,771	5,529	3,903	7,021	13,846	11,904	8,468
TOTAL	1,244,616	1,281,537	1,383,794	1,461,893	1,757,009	1,558,316	1,745,862	1,819,810	1,842,853	2,029,767

Source: Japan Customs

**Table 20: Baled Hay Imports (USA) by
Month 2002 (Japan)**

Month	Mt/month	Monthly Value 1000 Yen	Cumulative Mt	Cumulative Value 1000 Yen
1	112,677	3,350,877	112,677	3,350,877
2	115,484	3,464,478	228,161	6,815,355
3	120,722	3,598,840	348,883	10,414,195
4	129,531	3,857,523	478,414	14,271,718
5	146,313	4,145,264	624,727	18,416,982
6	120,083	3,271,855	744,810	21,688,837
7	131,718	3,524,444	876,528	25,213,281
8	113,885	2,959,325	990,413	28,172,606
9	119,883	3,068,307	1,110,296	31,240,913
10	73,489	1,990,893	1,183,785	33,231,806
11	139,533	3,783,839	1,323,318	37,015,645
12	167,289	4,628,165	1,490,607	41,643,810
TOTAL	1,490,607	41,643,810	1,490,607	41,643,810

Source: Japan Customs

**Table 21: Cube Imports (USA) by
Month 2002 (Japan)**

Month	Mt/month	Monthly Value 1000 Yen	Cumulative Mt	Cumulative Value 1000 Yen
1	29,728	820,517	29,728	820,517
2	29,163	826,461	58,891	1,646,978
3	29,395	824,042	88,286	2,471,020
4	31,461	890,487	119,747	3,361,507
5	31,958	869,573	151,705	4,231,080
6	25,628	671,255	177,333	4,902,335
7	31,043	775,651	208,376	5,677,986
8	27,644	672,492	236,020	6,350,478
9	24,781	602,409	260,801	6,952,887
10	17,504	440,068	278,305	7,392,955
11	32,921	837,779	311,226	8,230,734
12	37,398	946,326	348,624	9,177,060
TOTAL	348,624	9,177,060	348,624	9,177,060

Source: Japan Customs

Table 22: 2002 Hay & Cube Imports (Japan)

Origin	Metric Tons	Percent
USA	1,839,231	74.90%
CANADA	297,656	12.10%
AUSTRALIA	304,388	12.40%
OTHERS	15,607	0.60%
TOTAL	2,456,882	100.00%

Source: Japan Customs

Table 23: 2002 Pellet Imports (Japan)

COUNTRY	2002	
	Metric Tons	Percent
CANADA	146698	73.2%
NETHLDS	26596	13.3%
USA	15157	7.6%
ITALY	9476	4.7%
FRANCE	937	0.5%
GERMANY	856	0.4%
BELGIUM	253	0.1%
CHINA	220	0.1%
SPAIN	94	0.0%
AUSTRAL	70	0.0%
CHILE	51	0.0%
TOTAL	200408	100.0%

Source: Japan Customs

Table 24: 2002 Forage Imports (Japan)

Origin	Metric Tons	Percent
USA	1,854,388	69.78%
CANADA	444,354	16.72%
AUSTRALIA	304,458	11.46%
OTHERS	54,090	2.04%
TOTAL	2,657,290	100.00%

Source: Japan Customs

Table 25: 2001 West Coast Forage Exports to Japan

Origin	Metric Tons (1000)	Percent
PSW	739	42
PNW	1021	58
West Coast	1760	100

Source: Port of Portland

Table 26: 2002 PNW Hay Production

Area	2002 PNW Hay Production
	1000 Tons
Washington	3346
Oregon	3407
Idaho	5608
PNW	12361
PNW (MT)	12166

Source: USDA - NASS

Table 27: 2001 Influence of Exports to Japan on PNW Hay Market

All Hay	Exports	Influence
Metric Tons (1000)		Percent
11078	1021	9.2

Source: USDA – NASS, Port of Portland

Table 28: 2001 West Coast Forage Exports to Pacific Rim

Origin	Metric Tons	Percent
PSW	949	42
PNW	1290	58
West Coast	2259	100

Source: USDA – NASS, Port of Portland

Table 29: 2001 Influence of Exports to Pacific Rim on PNW Hay Market

All Hay	Exports	Influence
Metric Tons		Percent
11078	1290	11.6

Source: USDA – NASS, Port of Portland

Table 29a: 2001 Influence of Exports to Pacific Rim on WA Hay Market

All Hay	Exports	Influence
1000Metric Tons (P.O.P. & Tacoma)		Percent
3088	773	25

Source: USDA – NASS, Port of Portland

Table 30: Annual Alfalfa Baled Hay (Korea)

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA			13,400	23,055	29,875	18,606	54,814	85,233	77,741	99,290
CANADA			1,400	384	3,558	2,997	7,875	11,418	3,507	1,640
CHINA			728	0	92	0	104	38	297	336
OTHERS			1	540	927	316	2,517	1,094	1,988	3,084
TOTAL	0	0	15,529	23,979	34,452	21,919	65,310	97,783	83,533	104,350

Source: Korea Trade Statistics

Table 31: Other Baled Forage Product Imports (Korea)

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA			9,229	37,171	53,463	46,031	99,973	282,654	311,440	346,021
CHINA			506	2669	23680	11935	24014	24095	839	5913
CANADA			349	666	467	46	2,220	22,736	50,720	34,777
AUSTRALIA			0	166	45	214	784	4522	15097	42652
OTHERS			0	37	37	0	543	2,528	730	1,690
TOTAL	0	0	10,084	40,709	77,692	58,226	127,534	336,535	378,826	431,053

Source: Korea Trade Statistics

Table 32: Cube and Pellet Imports (Korea)

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA	13,578	6,054	14,087	19,390	30,080	15,121	19,425	24,658	17,032	6,757
CHINA	0	116	142	0	28	0	0	187	659	10597
CANADA	81,410	100,871	114,455	100,356	79,298	50,578	85,290	90,611	57,339	5,505
AUSTRALIA	96	459	0	41	0	598	222	162	127	237
SPAIN	0	0	0	0	0	0	0	0	5,764	12,543
OTHERS	1	183	4,601	2,822	1,019	773	647	405	0	4,826
TOTAL	95,085	107,683	133,285	122,609	110,425	67,070	105,584	116,023	80,921	40,465

Source: Korea Trade Statistics

Table 33: Annual Forage Imports (Taiwan)

ORIGIN	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	Metric Tons									
USA	60,635	93,727	116,497	129,479	147,821	129,373	164,902	179,681	188,615	157,224
CANADA	68,505	69,153	98,547	74,054	46,232	55,197	46,929	60,612	34,281	27,352
AUSTRALIA	115	28,656	21897	82,264	79,582	60,693	85563	92,405	25,316	33,854
OTHERS	687	85	1,632	2,845	2,229	2,576	1,496	234	3,034	4,534
TOTAL	129,942	191,621	238,573	288,642	275,864	247,839	298,890	332,932	251,246	222,964

Source: Directorate General of Customs, Ministry of Finance, ROC

Table 34: Annual Japan Milk Production

Year	Annual Milk Production, Milk Cows, and Milk per Cow		
	Production	Milk Cows (Average)	Milk Produced per Cow
	Mill lbs	1000 Head	Pounds
1975	10938	1122	9749
1985	16270	1329	12242
1990	16436	1294	12702
1995	16171	1214	13320
2000	18733	1148	16318

Table 35: Number of Dairy Cattle by Size of Dairy Farm, Japan 1975-2001

Year	Number of Dairy Cattle by Size of Dairy Farm, Japan 1975-2001						
	1-9 Head	10-14 Head	15-19 Head	20-29 Head	More than 30 Head	Heifers only	Total
	1000 head						
1975	476	288	269	371	340	41	1787
1986	169	161	182	404	1158	30	2103
1991	96	102	127	332	1367	17	2067
1996	43	60	75	234	1483	8	1873
2001	29	36	54	176	1401	7	1703

Table 36: Percent of Dairy Cattle by Size of Dairy Farm, Japan 1975-2001

Year	Percent of Dairy Cattle by Size of Dairy Farm, Japan 1975-2001						
	1-9 Head	10-14 Head	15-19 Head	20-29 Head	More than 30 Head	Heifers only	Total
	Percent						
1975	26.6%	16.1%	15.1%	20.8%	19.0%	2.3%	100.0%
1986	8.0%	7.7%	8.7%	19.2%	55.1%	1.4%	100.0%
1991	4.6%	4.9%	6.1%	16.1%	66.1%	0.8%	100.0%
1996	2.3%	3.2%	4.0%	12.5%	79.2%	0.4%	100.0%
2001	1.7%	2.1%	3.2%	10.3%	82.3%	0.4%	100.0%

Table 37: Korea Farm Household and Livestock Numbers by Year

Unit: 1,000 household, head

Year		1985	1990	1992	1994	1996	1998
Beef Cattle	Household	1,047	620	585	540	513	427
	Head	2,553	1,620	2,018	2,392	2,843	2,383
Dairy Cattle	Household	43	33	27	25	21	16
	Head	390	503	508	552	551	539
Pig	Household	251	133	98	54	33	27
	Head	2,852	4,528	5,462	5,955	6,515	7,544
Chicken	Household	302	161	188	188	187	168
	Head	51,081	74,463	73,323	80,569	82,829	85,847
Rabbit	Household	63	13	15	10	8	9
	Head	628	155	180	156	202	259
Deer	Household	2	5	7	8	9	11
	Head	22	53	69	88	111	74
Horse	Household	0.6	0.3	0.3	0.3	0.3	0.4
	Head	3	4	5	5	6	8
Goose	Household	1	0.6	0.8	0.9	1	1
	Head	3	2	4	5	6	10

Source: Korean Information Service