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Report Highlights: U.S. rye seed exports to Korea are expected to continue to strengthen through 2005 because of a government's plan to encourage farmers to switch from rice to forage production. Korea joined the International Union for the Protection of New Varieties of Plants in 2002 and has adjusted its laws to comply with IPR requirements for planting seed. Korea's program of biotechnology research has produced products which are nearing the commercialization stage.

Includes PSD changes: No
Includes Trade Matrix: No
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SECTION I : SITUATION AND OUTLOOK

Local production of grass and forage seed remains negligible. The Korean government seed production policy remains unchanged with developmental assistance still targeted for five types of seed: rice, barley, soybean, corn and potato.

In CY 2002, The National Seed Management Office (NSMO), charged with producing, processing and distributing the five targeted seed types in Korea, distributed the following types and quantities of seed: rice - 14,405 MT, barley 2,380 MT, soybean - 880 MT, corn - 120 MT, and potato - 9,520 MT. Local corn seed for forage production declined to 25 MT.

CY 2001 production of vegetable seed from both local and overseas fields decreased by 13 percent and 7 percent, respectively, due reduced seed import demand from Southeast Asian. Private Korean seed companies produced 70 percent of their total seed output on foreign farms. However, all seed from foreign production which private Korean producers brought back is counted as imports.

In MY 2001, Korean planting seed imports increased to 13,569 MT, up 14 percent from the previous year reflecting a sharp increase in rye imports. Despite the increase in quantity, the value of planting seed imports decreased to USD 42 million, down 13 percent from MY 2000. The Korean government has encouraged farmer to cultivate forage for feed or fertilizer in rice fields to reduce rice production under the "Green Manure Plan" campaign from 2002 - 2005. Farmers receive a subsidy for the cost of planting seed under the Green Manure Plan. Planting seed imports of forages are expected to increase in MY2002 to meet the greater demand generated by the government campaign.

The United States has been a major supplier of grass and forage seeds in the Korean market. In MY 2001, U.S. market share in Korea increased to 48 percent from 46 percent in the previous year (on a quantity basis) due to a sharp increase in imports of U.S. rye seed. The U.S presence in the Korean seed market is strengthened by its broad array of seeds, such as: corn, rye, sorghum, lucerne seed, clover seed, ryegrass, timothy grass, fescue seed, Kentucky bluegrass, orchard grass, sudan grass and lawn seed.

However, roughly 15 percent of shipments of U.S. rye seed exported to Korea have failed quarantine inspection because of contamination of the fungus, *Bipolaris specifera*. To date, the Korean government has already required about 500 MT of U.S. rye seed to be shipped back to the United States due to the fungal contamination.

First quarter MY 2002 trade data indicate that the United States will continue as a major supplier of grass, forage and lawn seed in Korean planting seed market in MY 2002. The government's "Green Manure Plan" campaign is expected to strengthen import demand for rye seed from the United States and Canada from 2002 to 2005.

The U.S. share of the USD 10 million imported grass and forage seed market stood at 56 percent, on a quantity basis, and 63 percent, respectively, on a value basis. The United States' competitive position in the imported grass and forage seed market should remain strong over the next three to five years due

to superior seed varieties. In the USD 26 million imported vegetable seed market, the United States garnered only a 10-percent share, on a quantity basis, and 5 percent, on a value basis.

Competition from international seed suppliers originates from Australia for oat and Sudan grass; from Japan for vegetable seed; and from Canada for rye seed, oat, lucerne, fescue and lawn seed. China competes on the Korean market with Chinese Milk Vetch (within the category of other grasses), herbaceous plants, seed of fruit trees and flowers.

As of January 7, 2002, Korea joined the International Union for the Protection of New Varieties of Plants (UPOV). Laws were already changed to comply with UPOV intellectual property rights (IPR) requirements. Laws now provide seed breeders with IPR protection on 113 seed varieties including 25 new varieties effective on July 1, 2002. Korea expects to add an additional 72 varieties to this list by CY2008.

The applied tariff for imported forage designated rye, oats, rapeseed and sorghum seed remains at "zero" percent. To claim the "zero" tariff, importers must submit a 'Certificate of Import Tax Break' issued by the National Agricultural Cooperative Federation to the Korean Customs Service according to the item 43 of Presidential decree under Customs Act.

The Ministry of Agriculture's Rural Development Administration (RDA) is conducting biotech research on development of transgenic crops. High value-added transgenic animals and plants are being developed by RDA for a total of 40 events from 16 different organisms of which 35 events are from 14 crops and 5 events are for 2 livestock species. In addition, RDA established a nationwide agricultural biotechnology system by founding the National Institute of Agricultural Biotechnology (NIAB) on March 2002. The NIAB conducts basic and applied research in agricultural biotechnology with other agricultural institutes and experiment stations. Ongoing projects include herbicide-resistant rice and Chinese cabbage; crops resistant to rust or bacterial leaf blight; and crops with special functions such as anti-senescence, anti-high blood sugar and enhanced vitamin E production.

Currently, 13 items of 5 different crops including herbicide-resistant rice and anti-viral potato are being tested for actual safety in isolated field and greenhouse plots. These items are expected to reach the commercialization stage in the near future, probably 2 - 5 years.

SECTION II: STATISTICAL TABLES

Table 1: Korea - Supply of Planting Seeds for Grass and Forage

| Korea - Supply of Planting Seeds for Grass and Forage (Metric Tons, Calendar year basis) | | | | | | |
|---|--------|----------|----------------|--------|----------|-------------|
| Calendar Year | Grass | | Forage | | | Grand Total |
| | Import | S. Total | Domestic 1/ | Import | S. Total | |
| 1991 | 185 | 185 | 294 | 2,949 | 3,243 | 3,428 |
| 1992 | 245 | 245 | 213 | 3,276 | 3,488 | 3,733 |
| 1993 | 286 | 286 | 169 | 3,696 | 3,865 | 4,151 |
| 1994 | 261 | 261 | 161 | 4,131 | 4,292 | 4,553 |
| 1995 | 212 | 212 | 64 | 3,835 | 3,899 | 4,111 |
| 1996 | 210 | 210 | 49 | 4,078 | 4,127 | 4,337 |
| 1997 | 190 | 190 | 73 | 4,215 | 4,288 | 4,478 |
| 1998 | 173 | 173 | 179 | 4,257 | 4,436 | 4,609 |
| 1999 | 102 | 102 | 90 | 3,779 | 3,869 | 3,971 |
| 2000 | 68 | 68 | 46 | 3,062 | 3,108 | 3,176 |
| 2001 | 51 | 51 | 28 | 2,944 | 2,972 | 3,023 |
| 2002 | 48 | 48 | 25 | 2,730 | 2,755 | 2,803 |

1/ Domestic forage seeds are mainly composed of corn and rye through 1994. Since 1995, the Korean government stopped supplying rye seed.

Source: The National Agricultural Cooperative Federation (NACF)

Table 2: Korea - CY2002 Supply of Forage and Grass Seed

| Korea - CY2002 Supply of Forage and Grass Seed (Kg, Calendar Year Basis) | | | |
|---|-----------------|------------------|------------------|
| Commodity | Spring Planting | Fall Planting | Total |
| Orchard grass | 6,940 | 18,100 | 25,040 |
| Tall fescue | 2,660 | 7,140 | 9,800 |
| Timothy | - | 2,260 | 2,260 |
| Kentucky bluegrass | 900 | 2,120 | 3,020 |
| Perennial Rye grass | 1,000 | 3,460 | 4,460 |
| Reed canary grass | 160 | 140 | 300 |
| Alfalfa | 680 | 960 | 1,640 |
| White Clover | 360 | 480 | 840 |
| Red Clover | 140 | 480 | 620 |
| Grass Seed Total | 12,840 | 35,140 | 47,980 |
| Forage Rape | 2,350 | 7,090 | 9,440 |
| Forage Oat | 107,420 | 309,210 | 416,630 |
| Winter Rye | 0 | 1,778,320 | 1,778,320 |
| Italian Ryegrass | 2,560 | 73,540 | 76,100 |
| Sudan grass F1 | 228,360 | 0 | 228,360 |
| Sorghum F1 | 7,200 | 0 | 7,200 |
| Corn | 214,300 | 0 | 214,300 |
| Forage Seed Total | 562,190 | 2,168,160 | 2,730,350 |
| Total Imported Seed | 575,030 | 2,203,300 | 2,778,330 |
| Domestic Corn | 25,258 | 0 | 25,258 |
| Grand Total | 600,288 | 2,203,300 | 2,803,588 |

Source: National Agricultural Cooperatives Federation

Table 3: Korea - MY 2001/2002 (July/June) Planting Seed Imports

| Korea - MY 2001/2002 (July/June) Planting Seed Imports (Unit: KG; US\$,000 based on CIF) | | | | |
|---|------------|--------|-----------|-------|
| MY 2001/02 (July/June) | From World | | From U.S. | |
| Commodity | Volume | Value | Volume | Value |
| Corn | 266,153 | 1,769 | 266,153 | 1,769 |
| Rye | 6,117,330 | 2,931 | 3,396,130 | 1,630 |
| Oats | 449,060 | 185 | 0 | 0 |
| Lucerne Seeds | 13,013 | 30 | 9,386 | 21 |
| Clover Seeds | 7,750 | 28 | 7,250 | 26 |
| Fescue Seeds | 876,457 | 1,352 | 836,268 | 1,302 |
| Kentucky Blue Grass | 173,664 | 557 | 173,664 | 557 |
| Rye Grass | 565,199 | 579 | 431,195 | 528 |
| Timothy Grass | 4,083 | 7 | 2,023 | 3 |
| Sudan Grass | 537,276 | 702 | 306,709 | 421 |
| Orchard Grass 1/ | 113,416 | 226 | 85,116 | 166 |
| Other Grass | 1,478,890 | 2,785 | 194,185 | 419 |
| Herbaceous Plants | 30,012 | 2,285 | 3,657 | 499 |
| Vegetable Seeds | 1,896,813 | 25,521 | 181,505 | 1,353 |
| Seeds of other forest tree | 112,410 | 419 | 1,011 | 24 |
| Seed of fruit tree | 125,099 | 256 | 137 | 24 |
| Lawn Seed | 588,246 | 1,045 | 519,246 | 890 |
| Other | 213,680 | 1,148 | 49,433 | 221 |
| Total | 13,568,551 | 41,825 | 6,463,068 | 9,853 |

1/ consisted of orchard, reed canary and red top.

Source: Korean Customs Service

Table 4: Korea - MY 2001/2002 Planting Seed Exports

| Korea - MY 2001/2002 Planting Seed Exports (Unit: KG; US\$,000 based on FOB) | | | | |
|---|----------|--------|---------|-------|
| MY 2001/02(July/June) | To World | | To U.S. | |
| Commodity | Volume | Value | Volume | Value |
| Herbaceous Plants | 785 | 9 | 0 | 0 |
| Vegetable Seed | 476,228 | 17,430 | 9,254 | 1,081 |
| Seed of Other Forest Tree | 12,316 | 140 | 130 | 12 |
| Lawn Seed | 60 | 1 | 60 | 1 |
| Other | 68,266 | 547 | 250 | 1 |
| Total | 557,655 | 18,127 | 9,694 | 1,095 |

Source: Korean Customs Service

Table 5: Korea - Vegetable Seed Production

| Korea - Vegetable Seed Production (Kg, Calendar Year) | | | | | | |
|--|-----------|---------------------|------------------------------|-----------|---------------------|------------------------------|
| Commodity | CY2000 | | | CY2001 | | |
| | Total | Local production | Overseas Production 1/ | Total | Local production | Overseas Production 1/ |
| White Radish | 1,079,154 | 335,389 | 743,765 | 976,831 | 321,393 | 625,438 |
| Chinese Cabbage | 292,511 | 212,811 | 79,700 | 210,452 | 158,849 | 51,602 |
| Cabbage | 26,010 | 5,856 | 20,154 | 34,463 | 6,623 | 27,840 |
| Onion | 56,802 | 23,014 | 33,788 | 62,206 | 18,253 | 43,953 |
| Welsh Onion | 107,782 | 11,634 | 96,148 | 186,647 | 6,325 | 180,322 |
| Carrot | 63,267 | 1,272 | 61,995 | 76,707 | 867 | 75,840 |
| Lettuce | 68,949 | 1,410 | 67,539 | 68,389 | 1,470 | 66,919 |
| Spinach | 235,929 | 2,762 | 233,167 | 151,716 | 1,620 | 150,096 |
| Red Pepper | 56,037 | 3,702 | 52,355 | 66,898 | 4,182 | 62,716 |
| Tomato | 1,309 | 44 | 1,265 | 1,726 | 77 | 1,649 |
| Melon | 4,124 | 846 | 3,278 | 2,775 | 873 | 1,902 |
| Cucumber | 9,088 | 1,411 | 7,677 | 7,287 | 615 | 6,672 |
| Water Melon | 30,519 | 3,335 | 27,184 | 31,750 | 3,532 | 28,218 |
| Squash | 20,892 | 2,609 | 18,283 | 23,958 | 2,061 | 21,897 |
| Total | 2,052,373 | 606,095 | 1,446,278 | 1,871,805 | 526,742 | 1,345,065 |

1/ Korea Seed Association includes overseas production in total vegetable seed production in Korea because local seed companies cultivated the seed abroad and then imported it into Korea.

Source: Korean Seed Association

Table 6: Korea - CY2001 Vegetable Seed Imports

| Korea - CY2001 Vegetable Seed Imports (Kg, US\$) | | | | | | |
|---|--------------|------------|-------------|-----------|--------------------|------------|
| | Total Import | | Pure Import | | Oversea Production | |
| | Quantity | Value | Quantity | Value | Quantity | Value |
| White Radish | 793,716 | 3,413,204 | 168,278 | 828,463 | 625,438 | 2,584,741 |
| Chinese Cabbage | 51,605 | 176,124 | 3 | 943 | 51,602 | 175,181 |
| Cabbage | 29,191 | 1,351,484 | 1,351 | 309,001 | 27,840 | 1,042,483 |
| Onion | 56,163 | 5,745,244 | 12,210 | 3,160,873 | 43,953 | 2,584,371 |
| Welsh Onion | 195,404 | 2,808,332 | 15,082 | 426,815 | 180,322 | 2,381,517 |
| Carrot | 94,209 | 1,316,331 | 18,369 | 735,903 | 75,840 | 580,428 |
| Lettuce | 68,130 | 509,011 | 1,211 | 55,077 | 66,919 | 453,934 |
| Spinach | 262,071 | 1,166,009 | 111,975 | 706,349 | 150,096 | 459,660 |
| Red Pepper | 62,991 | 2,394,619 | 275 | 175,367 | 62,716 | 2,219,252 |
| Tomato | 1,807 | 1,537,126 | 158 | 960,080 | 1,649 | 577,046 |
| Melon | 1,902 | 94,219 | 0 | 0 | 1,902 | 94,219 |
| Cucumber | 7,046 | 440,789 | 374 | 118,582 | 6,672 | 322,207 |
| Water Melon | 28,232 | 1,388,335 | 14 | 7,344 | 28,218 | 1,330,991 |
| Squash | 22,188 | 495,722 | 291 | 64,694 | 21,897 | 431,028 |
| Total | 1,674,655 | 22,836,549 | 329,591 | 7,549,491 | 1,345,064 | 15,237,058 |

Source: Korean Seed Association

Table 7: Korea - CY2002 List of National Recommended Cultivars of Grass and Forage Crops
(As of end March 2002)

| GRASSES | |
|----------------------------|--|
| Orchard grass | Potomac, Frode, Frontier, Ambassador, Hallmark, Summer Green, Amba, Warrior, 93E. |
| Tall fescue | Fawn, Alta, Festorina, Felopa, AU-Triumph, Cajun, Montebello. |
| Timothy | Climax, Clair, Odenwalder, Hokuo. |
| Perennial Rye grass | Norlea, Taptoe, Reveille, Bastion, Ellett, Bison, Tetrelite, Friend. |
| Kentucky Bluegrass | Kenblue, Monopoly. |
| Red Top | Streaker. |
| Reed Canary grass | Frontier, Venture, Vantage |
| Meadow Fescue | Joma |
| Bromegrass | Regar |
| LEGUMES | |
| Alfalfa: Pacer | Pacer, Scout, Team, Luna, Vernal, 5444, Drummor |
| White Clover | California Ladino, Regal |
| Red Clover | Kenland, Titus, Atlas, TR2000. |
| Birdsfoot Trefoil | Empire, Viking. |
| FORAGE CROPS | |
| Corn | P3394, P3156, P3163, P3489, P3223, P3310, P3313, P3130, P36H36, P32P75, P32J55, P33F18, P33J56, P32G94 , DK689, DK729, DK713, DK501, DK720S, DK537, DK754S , G4743, G4624, GL499, G4655, NC5514, NC7177, NC4880 , GW6959, <u>GW737</u> , Garst8842, Garst8396IT, Garst8285, N73-Q3. |
| Sorghum-Sudan grass Hybrid | P855F, P877F, Jumbo, TE-Haygrazer, Sordan 79, GW9110G, GW104G, W9161F, NC+855, SX-17, Speed Feed, G-7, Turbo 9, Turbo10, TE-Evergreen, Betta Grazer, AG2501, Dairyman's Dream, PAC F 8350 . |
| Sorghum-Sorghum Hybrid | NK-367, SS405, KF429 |
| Rye | Homil22. Koolgrazer, Elbon, Vita-graze, Bonel, Athens Abruzzi, Maton, Wrens abruzzo, Wintermore, Danko, Wintergrazer 70, Luchs, Olkon, Bates, Humbolt, MAC Blue, Barr Grazer, Barr Grain Master, GI85Ryegrazer, GI87Ryegrazer, Lovaszdatonai. |
| Oats: | Cayuse, Magum, Foothill, West(Speed Oat) , Murray, Swan, Ensiler, Yilgarn, Palinup, Cashel, Irwin, Dane,Troy, A.C. Juniper, Haabusa. |
| Forage Rape | Akela, Velox, Ramon, Sparta, Barnapoli |
| Italian rye grass | Dalita, Tetrone, Barmultra, Tetraflorum, Gordo, Sikem, Bartissimo, Wilo, Combita, Tosca, Florida 80, Tachiwase, Marshall, Grazer, TAM90, Typhoon, Ribeye. |

Note: Entries in boldface are new.

Source: National Agricultural Cooperative Federation

Table 8: Korea - 2002 List of Protected Plant Varieties (25 varieties)

| Korea - The List of Protected Plant Varieties | |
|---|--|
| Field Crops | rye(<i>Secale cereale</i> L.), red bean(<i>Vigna angularis</i>), green bean(<i>Vigna radiata</i>), pea(<i>Pisum sativum</i> L.) |
| Vegetables | egg plant(<i>Solanum melognena</i> L.), gourd (<i>Lagenaria siceraria</i> Standley), <i>Brassica rapa</i> L. ssp <i>Chinensis</i> Jusl. |
| Flower | <i>Sterelitzia</i> spp., <i>Cattleya</i> spp., <i>Oncidium</i> Alliance, <i>Hosta</i> spp., <i>Campanula</i> spp., <i>Pelargonium</i> spp., <i>Paeonia Suffruticosa</i> , <i>Kalanchoe</i> spp., <i>Chamecereus sivistrii</i> |
| Special Crops | <i>Canoderma</i> spp., <i>Angelica koreana</i> Max.(<i>Ostericum koreanum</i> Max.), <i>Pleuroperus multiflorus</i> Turcz, <i>Alisma</i> spp., <i>Scutellaria baicalensis</i> Gerogi, <i>Paeonia lactiflora</i> , <i>Carthanmus tinctorius</i> L., <i>Codonopsis lanceolata</i> Traut |
| Fruits | kiwi (<i>Actinidia chinensis</i> Planch (<i>Actinidia delicosa</i> C.F. Liang et Ferguson |

Source: Ministry of Agriculture and Forestry

Table 9: Korea - Applied Tariff Schedule for Planting Seeds

| Korea - Applied Tariff Schedule for Planting Seeds (Percent) | | | | | | | |
|---|--------------|--------------|---------------|-------------------|--------------|---------------|-------------------|
| Commodity | H.S. Code | 2002 | | | 2003 | | |
| | | General rate | In-Quota rate | Out-of-quota rate | General rate | In-Quota rate | Out-of-quota rate |
| Peas | 0713.10.1000 | 30 | na | na | 30 | na | na |
| Beans | 0713.31.1000 | 30 | 30 | 621 | 30 | 30 | 614.3 |
| Red Beans | 0713.32.1000 | 30 | 30 | 430.1 | 30 | 30 | 425.5 |
| Kidney Beans | 0713.33.1000 | 30 | na | na | 30 | na | na |
| Wheat 1/ | 1001.90.9010 | 3(2.04) | na | na | 3(1.92) | na | na |
| Rye 2/ | 1002.00.1000 | 3(0) | 3 | 111.1 | 3(0) | 3 | 109.9 |
| Oats 2/ | 1004.00.1000 | 3(0) | 3 | 567.1 | 3(0) | 3 | 561 |
| Forage Corn 3/ | 1005.10.0000 | 0 | 0 | 335.4 | 0 | 0 | 331.7 |
| Sweet Corn 3/ | 0712.90.2091 | 0 | 0 | 378.2 | 0 | 0 | 374.1 |
| Sorghum 2/ | 1007.00.0000 | 3(0) | 3 | 796.7 | 3(0) | 3 | 788.1 |
| Millet 2/ | 1008.20.1010 | 3(0) | 3 | 18.4 | 3(0) | 3 | 18.2 |
| All Seed | 1209.xx.xxxx | 0 | na | na | 0 | na | na |

1/ Number in parentheses is a temporary duty.

2/ Commodity imported under the reduced tariff policy. CMA annual quota through 2004 for the respective commodity is as follows: Rye - 1,327.3 MT, Oats - 597.3 MT, Sorghum - 13.7 MT, and Millet - 0.4 MT.

3/ Corn seed for forage and sweet corn, CMA annual quota - 247 MT, imported at free tariff rate through 2004. Ministry of Agriculture and Forestry will allocate additional quota, if requested by farmers.

Source: Korea Customs Research Institute, Tariff Schedules of Korea