

DEVELOPMENT OF DRY ONION PRODUCTION AND FOREIGN TRADE IN TURKEY AND IN THE WORLD

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Abstract

Onion is one of the rare vegetables that are used in the kitchens of both the rich and poor families in the world regardless of the income level. In addition to containing many vitamin and mineral substances that are important for human nutrition, it is also a medical plant the use of which is known since the beginning of human history. Turkey holds an important spot in the world with regard to onion production and production area. The objective of this study was to examine dry onion production and foreign trade in Turkey and in the world during the 1996-2013 period. Whereas world dry onion production was 44.8 million tons during the 1996-2000 period, it increased by 1.9 times thus reaching 84.8 million tons. India showed the greatest development during the same period with an increase of 4.3 times, whereas a decrease of 13% took place in the production of dry onion in Turkey. China is ranked first in the world with regard to dry onion production with a share of 26.35%, whereas India is ranked second with a share of 22.76% and Turkey is ranked number six with a share of 2.25%. When dry onion yield is examined, it can be seen that the world average is 21.07 ton/ha, that Ireland is ranked first with an average of 68.75 tons/ha, that South Korea is ranked second with 64.58 tons/ha and that Turkey is ranked number 11 with a share of 29.86 tons/ha. Whereas world dry onion export was 3.4 million tons during 1996-2000 period, it increased by two times thus reaching 7 million tons in 2013. India is ranked first in the world in dry onion export with a share of about 21.06%, the Netherlands is ranked second with a share of 17.43% and China is ranked third with a share of 10.64%. Whereas Turkey is ranked number 10 in the world with a dry onion export share of about 2.25%. About 52% of Turkish dry onion export is made to Iraq. When world dry onion import is examined, it can be observed that the top five countries are Malaysia (6.71%), the USA (6.38%), England (6.34%), Bangladesh (5.26%) and Japan (4.41%). Main problems in the dry onion sector of Turkey are that the manufacturers are not organized sufficiently and that there is no production plan.

Key words: dry onion, development, production, foreign trade, Turkey

Onion (*Allium cepa L.*), whose green leaves and tubers are used, is a pungent herbaceous plant from liliaceous family. It is one of the rare vegetables used in the kitchens of all rich and poor families in the world regardless of the income level. In addition to containing many vitamins and mineral substances that are important for human nutrition, it is a medical plant whose usage is known since the beginning of human history (DPT, 2001). It is one of the oldest products cultivated and its origin is West Asia, but it is produced in a large area in the world. *Allicin* and *Alliin* in the onion whet the appetite, facilitate digestion and serve as a regulatory impact on intestines. It has gained importance in modern medicine due to containing a variety of substances. It is also used in making almost every kind of meals and sauces. Its consumption and production are substantially made due to all these features (Pala, M., Saygı, B., 1991).

Dry onion has an important place in human nutrition and trade of agricultural products in Turkey. Although the dry onion cultivation is made in almost every region of Turkey, it is seen that the cultivation is concentrated on Marmara, North Central and East Anatolian Regions. The objective of this study is to examine the dry onion production and foreign trade in Turkey and in the world. For this purpose, the study compared some indicators about dry onion such as production, production area, yield, export, import, price and consumption per capita for the major onion producer countries in the world and Turkey. Finally, the serious issues faced by the sector were identified and the solutions for them were proposed.

MATERIAL AND METHOD

The main material of the study consisted of data and reports from the institutions such as Food

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and Agriculture Organization of the United Nations (FAO), Istanbul Chamber of Commerce (ITO), and State Planning Organization (DPT). It was also utilized from the formerly performed similar studies on the subject. In the light of the data and information, the developments in dry onion production areas, yields, productions, consumptions, exports, imports and world prices were investigated for Turkey and the important countries in the world in terms of dry onion production and trade between the years 1996-2013. As calculating the index and rates, the data were interpreted as charts and graphs.

RESULTS AND DISCUSSIONS

Dry onion production is spread over a wide area in the world due to adapting to different climate conditions and widespread use. The developments in production areas for major dry

onion producer countries in the world are given in Table 1. While the world dry onion production area was 2.6 million hectares in average in the 1996-2000 period, it rose to 4.4 million hectares in 2013 as showing a 1.7-fold increase. It is seen that the largest increase is in Nigeria when the dry onion production area is examined for the major producing countries in the world. In the analyzed period, the dry onion production area in Nigeria has increased by about 4.2 times. Following Nigeria, the countries where the largest increase occurs are Bangladesh (4-fold), India (2.8-fold), Uganda (2.3-fold) and Myanmar (1.9-fold), respectively. In the same period, Turkish dry onion production area has decreased to 64 thousand tons as showing a decline by around 39%. According to 2013 data, India has the largest share in the world dry onion production

Table 1

Development of dry onion production area in the world (ha)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Share (%) (2013)	Index*
India	434 080	558 340	848 640	1 087 230	1 052 000	1 217 000	27.75	280
China	540 004	808 746	962 636	1 015 239	1 021 242	1 026 250	23.40	190
Nigeria	45 062	63 362	187 000	373 450	386 300	190 000	4.33	422
Bangladesh	34 014	49 379	118 989	127 940	135 721	134 354	3.06	395
Pakistan	87 064	110 831	137 500	147 600	129 700	125 900	2.87	145
Indonesia	89 931	84 473	97 661	93 667	99 519	94 898	2.16	106
Vietnam	63 672	78 719	88 945	88 598	90 000	92 000	2.10	144
Russia	100 800	118 294	95 250	95 500	92 100	85 740	1.96	85
Myanmar	36 751	58 868	70 115	71 980	69 800	70 600	1.61	192
Iran	47 035	47 272	54 251	61 519	71 000	70 125	1.60	149
Uganda	28 646	45 623	63 029	61 000	62 000	66 521	1.52	232
Turkey	104 200	85 356	66 606	74 000	63 000	63 796	1.45	61
World	2 623 171	3 165 940	3 918 706	4 541 216	4 442 772	4 385 306	100.00	167

FAO, 2016.

* Index: 1996-2000= 100

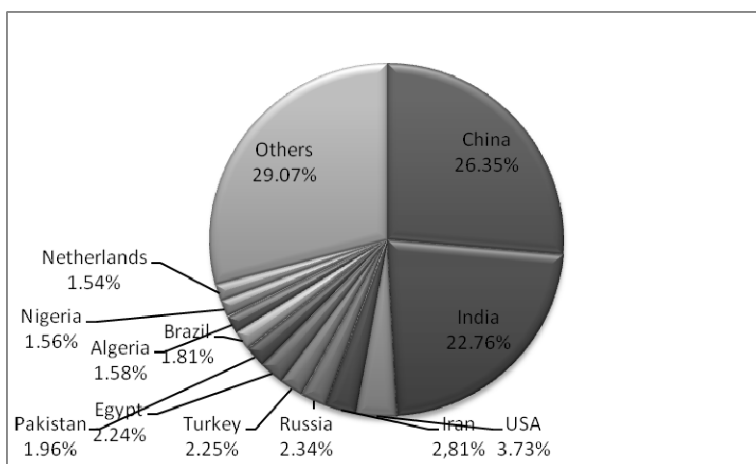


Figure 1 The share of World dry onion production for the top-12 countries (2013) (FAO, 2016)

Table 2

Development of dry onion production in the world (1000 ton)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Index
China	11270	17241	20757	22065	22245	22345	198
India	4467	6584	13118	17511	16813	19299	432
USA	3134	3333	3407	3361	3277	3159	101
Iran	1317	1566	1869	2168	2260	2382	181
Russia	1132	1550	1591	2123	2081	1985	175
Turkey	2194	2150	1876	2141	1736	1905	87
Egypt	644	853	1778	2304	2025	1903	296
Pakistan	1218	1518	1859	1940	1692	1661	136
Brazil	949	1160	1468	1523	1519	1539	162
Algeria	351	555	854	1144	1183	1344	383
Nigeria	577	848	1285	716	900	1320	229
Netherlands	685	940	1167	1541	1353	1310	191
World	44845	57852	94488	84373	81507	84803	189

FAO, 2016.

* Index: 1996-2000= 100

area. Its share is 27.75% and it is followed by China (23.40) and Nigeria (4.33%). Turkey is ranked number 12 in the world with a share of 1.45%.

Rapid population growth in the world caused a significant increase in the production of dry onion. The developments of the production in the major dry onion producing countries in the world are presented in Table 2. The world dry onion production reached 84.8 million tons with a 1.9-fold increase in 2013 while it was 44.8 million tons in average between the years 1996-2000. It is observed that the largest increase occurs in India when the dry onion production figures are examined for the major producing countries in the world. In the studied period, the dry onion production in India increased about 4.3-fold. The following countries having the largest increase are Algeria (3.8-fold), Egypt (3-fold), Nigeria (2.3-

fold) and China (2-fold). In the same period, Turkey's dry onion production fell to 1.9 million tons with a decrease by nearly 13% in 2013 while it was 2.2 million tons in average between the years 1996-2000.

According to Figure 1 presenting the share of world dry onion production for the top-12 countries in 2013, China has the largest share (26.35%) in the world dry onion production and is followed by India (22.76%) and the USA (3.73%). Regarding Turkey, it is ranked sixth in the world dry onion production with a share of 2.25%.

The developments of dry onion yields for some countries in the world are given in Table 3. While the world dry onion yield per hectare was 17.17 tons according to the calculations made on the basis of 1996-2000 period, it reached 21.07 tons with an approximately 23% increase in 2013. It is found that the largest increase in yield is in

Table 3

Development of dry onion yield in the world (ton/ha)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Index*
Ireland	28.82	51.84	62.30	59.64	62.50	68.75	239
South Korea	57.63	59.97	66.33	66.16	57.04	64.58	112
Australia	42.66	44.80	49.19	53.89	51.68	54.79	128
USA	45.93	49.89	54.25	56.26	54.62	54.47	119
Spain	41.34	46.34	48.76	53.31	51.30	53.69	130
Sweden	34.42	31.14	34.48	41.42	50.40	49.60	144
Austria	54.22	45.23	45.23	62.09	46.43	47.44	87
Netherlands	57.33	47.96	44.19	51.64	49.68	45.80	80
Greece	23.05	26.72	26.43	33.29	35.66	45.33	197
Chile	40.44	48.55	48.19	46.31	41.80	44.89	111
Turkey	21.03	23.73	28.23	28.94	27.55	29.86	142
World	17.17	19.05	20.29	20.84	20.56	21.07	123

FAO, 2016

* Index: 1996-2000= 100

Development of dry onion export in the world (ton)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Index*
India	316 260	737 219	1 420 613	1 110 139	1 527 800	1 476 575	467
Netherlands	506 832	745 008	1 085 015	1 326 576	1 226 751	1 222 270	241
China	131 969	399 992	587 445	745 027	620 722	745 818	565
Mexico	254 935	266 374	301 008	370 135	374 710	378 016	148
USA	299 933	320 018	311 124	356 159	332 175	358 003	119
Egypt	122 349	286 317	230 439	490 922	319 248	329 736	270
Spain	226 273	211 897	242 084	253 384	256 228	287 766	127
Argentina	258 649	184 217	219 598	212 038	149 686	225 088	87
Peru	27 173	47 301	95 421	177 306	162 364	196 137	722
Turkey	134 465	115 112	150 034	119 820	140 768	158 036	118
Yemen	7 060	33 208	70 122	132 423	112 718	124 924	1769
Poland	103 875	120 685	128 632	111 662	119 222	111 515	107
World	3 445 260	4 638 507	6 217 638	6 833 883	6 534 833	7 010 515	203

FAO, 2016.

* Index: 1996-2000= 100

Ireland with a 2.3-fold. The dry onion yield per hectare in Ireland rose to 68.75 tons in 2013 while it was 28.82 tons in average between the years 1996-2000. Following Ireland, Greece is ranked second (2-fold). In the studied period, there is an increase of around 42% in dry onion yield in Turkey. It can be said that developments in the use of agricultural techniques such as especially fertilizer use and the proliferation of agricultural protection are effective in yield increase in Turkey. According to 2013 data, Ireland is ranked first in the world dry onion yield with 68.75 ton/ha and is followed by South Korea (64.58 ton/ha), Australia (54.79 ton/ha), the USA (54.79 ton/ha) and Spain (53.69 ton/ha), respectively. It is determined that Turkey is over the world average (21.07 ton/ha) with a 29.86 ton/ha yield. It is seen that Turkey's dry onion yield is not in the desired level. Especially in recent years, its reason is the pink root rot disease causing significant yield losses. It

is necessary to plant disease resistant varieties and to apply crop rotation in order to effectively combat the disease. Although India is ranked first in the production area of dry onion and ranked second in the production, it is below the world average in dry onion yield with about 17.01 ton/ha.

The developments of dry onion export in the world are presented in Table 4. While the world dry onion export was 3.4 million tons in average between the years 1996-2000, it reached 7 million tones as showing a 2-fold increase in 2013. In the examined period, the largest increase in dry onion export is in Yemen and the increase is around 17.7-fold. The reason of such high growth in Yemen is that the average export volume is very low from 1996 to 2000. The other countries where significant increase occurs in export are Peru (7.2-fold), China (5.7-fold) and India (4.7-fold). In the same period, whereas Turkish dry onion export was 134 thousand tons during 1996-2000 period, it

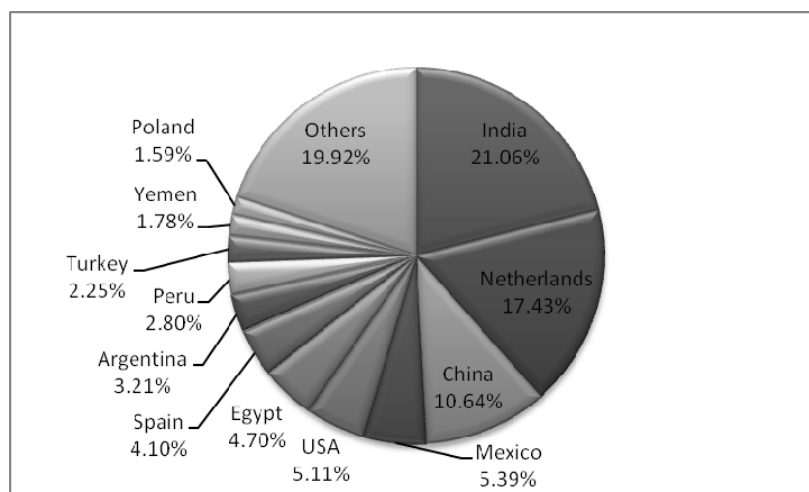


Figure 2 The share of World dry onion export for the top-12 countries (2013) (FAO, 2016)

Table 5

Development of dry onion export in the world (1000 \$)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Share (%) (2013)	Index
India	56 006	120 046	375 268	370 736	294 760	603 519	18.47	1078
Netherlands	128 345	180 953	407 560	522 293	411 043	537 413	16.45	419
China	30 104	79 755	168 545	302 672	293 537	373 362	11.43	1240
Mexico	155 861	201 795	259 408	301 175	308 031	363 721	11.13	233
USA	101 896	124 634	188 633	215 390	221 542	257 801	7.89	253
Egypt	12 874	27 654	88 100	215 617	157 288	202 553	6.20	1573
Spain	57 798	60 194	107 134	122 488	101 716	146 538	4.48	254
Argentina	49 582	27 504	64 464	75 063	51 522	89 532	2.74	181
Peru	7 937	13 412	25 911	42 888	54 402	62 938	1.93	793
France	18 208	21 745	41 130	53 289	40 047	59 317	1.82	326
Poland	15 837	26 494	56 921	54 143	45 518	52 175	1.60	329
Turkey	20 218	12 605	21 526	21 414	20 783	27 225	0.83	135
World	906 951	1 182 302	2 241 068	2 893 539	2 417 376	3 267 614	100.00	360

FAO, 2016.

* Index: 1996-2000= 100

increased by 18% reaching 158 thousand tons in 2013.

According to Figure 2 showing the share of world dry onion export for the top-12 countries in 2013, India is ranked number one in the world dry onion export with a share of 21.06% and is followed by the Netherlands (17.43%), China (10.64%), Mexico (5.39%) and the USA (5.11%), respectively. Turkey has about 2.25% share in the world dry onion export with 158 thousand tons. Turkish dry onion is exported to Iraq (52%), Russia (14%), Syria (8%), Bulgaria (7%) and Georgia (7%), respectively. These five countries constitute 88% of Turkey's export (FAO, 2016).

The development of world dry onion export in value is given in Table 5. Whereas the world dry onion exports in value was \$907 million in average

during 1996-2000 period, it rose to around \$3.3 billion as increasing by 3.6 times in 2013. India is ranked number one in the world dry onion export with a share of 18.47% and is followed by the Netherlands (16.45%), China (11.43%), Mexico (11.13%) and the USA (7.89%), respectively. Turkey is ranked number 12 with nearly \$27 million export (0.83%) in the world dry onion export.

The developments in the amount of dry onion imports for Turkey and 11 dry onion importer countries in the world are shown in Table 6. In the calculations based on 1996-2000 period, it is seen that there is a significant amount of increase in Bangladesh's import. The amount of dry onion import in Bangladesh rose to 360 thousand tons with around 10-fold increase while it

Table 6

Development of dry onion import in the world (ton)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Share (%) (2013)	Index*
Malaysia	224 888	303 914	438 264	453 651	442 495	459 874	6.71	204
USA	257 576	292 375	345 100	394 053	385 265	436 952	6.38	170
England	180 397	269 711	351 535	356 748	338 636	434 584	6.34	241
Bangladesh	36 639	173 011	432 722	268 109	374 213	360 267	5.26	983
Japan	209 864	257 940	250 095	373 123	342 293	302 225	4.41	144
S. Arabia	159 569	189 140	226 760	323 126	305 747	279 303	4.08	175
Russia	387 156	472 562	513 843	453 332	229 861	243 536	3.55	63
Germany	263 478	261 857	233 588	278 360	232 238	237 307	3.46	90
Un.Arab.Em	145 821	162 480	218 734	175 370	225 121	200 209	2.92	137
Canada	127 592	157 037	154 988	178 307	175 595	186 070	2.72	146
Sri Lanka	105 646	124 991	159 564	177 538	152 929	184 260	2.69	174
Turkey	1 176	146	406	7 548	365	1 224	0.02	104
World	3 410 725	4 414 713	5 919 572	6 399 757	6 403 811	6 851 023	100.00	201

FAO, 2016.

* Index: 1996-2000= 100

Table 7

Development of dry onion import in the world (1000 \$)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	Share (2013)	Index*
USA	153612	195355	260346	294263	269697	364058	10.97	237
England	71520	106966	202045	231480	180920	246102	7.42	344
Malaysia	61880	79277	132258	191487	137763	213423	6.43	345
Germany	87488	95555	136232	239393	133131	171823	5.18	196
Japan	68851	77157	99455	176174	181780	170468	5.14	248
Canada	45983	69772	540690	119148	125641	152253	4.59	331
Bangladesh	8054	35665	144791	89611	66800	143185	4.32	1778
Russia	75651	75939	158458	208171	106815	124327	3.75	164
Viet Nam	627	3639	25374	55138	78455	119598	3.61	19074
Netherlands	28329	30144	67751	131717	79824	103766	3.13	366
S. Arabia	26936	31041	334099	121243	110561	99213	2.99	368
Turkey	144	24	74	1.135	54	171	0.01	119
World	1 013 345	1 275 912	2 325 909	3 031 086	2 496165	3 317 301	100.00	327

FAO, 2016

* Index: 1996-2000= 100

was 36 thousand tons in average in 1996-2000 period. The other countries in which a significant increase in the amount of import occurs are England (2.4-fold), Malaysia (2-fold) and Saudi Arabia (1.7-fold). When the shares of importing countries in the world dry onion import are examined, Malaysia is ranked first with a share of 6.71% and is followed by the USA (6.38%), England (6.34%) and Bangladesh (5.26%), respectively.

The development of the world dry onion import in value is given in Table 7. Whereas the world dry onion import in value was \$1 billion in 1996-2000 period, it reached \$3.3 billion as increasing by 3.3 times in 2013. The USA is ranked first with a share of 10.97% and is followed by England (7.42%), Malaysia (6.43%), Germany (5.18%) and Japan (5.14%), respectively. Regarding Turkey, it is not an importing country in terms of dry onion and therefore its import value is very low.

The development of dry onion prices in some countries in the world is presented in Table 8. In the studied period, it is determined that the largest increase in the dry onion price occurred in Israel. Dry onion price in Israel increased to 522 \$/ton with a 2.7-fold rise in 2014 while it was 197 \$/ton in average in 1996-2000 period. A 2.3-fold increase occurred in dry onion price in England and it is ranked second. When Turkish dry onion price is investigated in the studied period, it is observed that there have been important fluctuations since 2011 although there was an increase in the price until 2011. The dry onion is a product marketed under free market conditions and its prices are formed by free market conditions.

Producers determine the dry onion production depending on the prices in the previous production period. When the dry onion prices are high, the producers make production in a much larger area; otherwise the production is made in a

Table 8

Development of dry onion price in some countries (\$/ton)

Countries	1996-2000	2001-2005	2006-2010	2011	2012	2013	2014	Index*
Greece	366	394	621	695	482	619	620	169
Israel	197	259	408	569	545	747	522	265
England	226	253	391	497	338	501	514	227
USA	252	255	307	240	313	331	300	119
Russia	170	163	278	310	186	230	282	166
Iran	280	143	185	173	282	378	277	99
Austria	142	143	248	258	169	313	255	180
Germany	145	186	269	301	181	318	243	168
Turkey	236	264	388	455	271	277	238	101
Ukraine	111	120	206	213	91	225	184	165

FAO, 2016.

* Index: 1996-2000=100

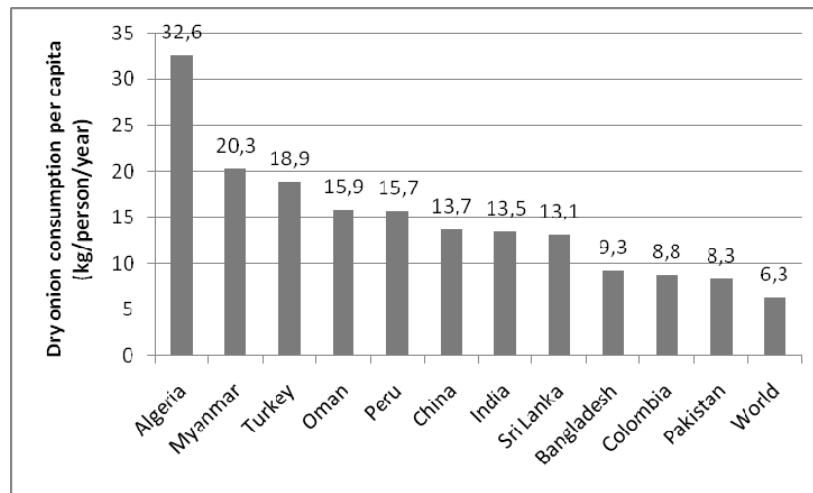


Figure 3 Dry onion consumption per capita in World (2013) (FAO, 2016)

smaller one. In a study covering the 1975-2006 period, it is revealed that the correlation between dry onion price and its production level is 92%. The result statistically shows that there is a very high interaction between the dry onion production and its price (Erdal, G. and Erdal, H., 2008).

The annual dry onion consumption per capita in 2013 is given in Figure 3. According to the data, the highest share of the dry onion consumption per capita is in Algeria in the world and the annual dry onion consumption per capita is 32.6 kg in this country. It is followed by Myanmar (20.3 kg/person/year), Turkey (18.9 kg/person/year), Oman (15.9 kg/person/year) and Peru (15.7 kg/person/year), respectively. The annual dry onion consumption per capita is 6.3 kg as a world average. Thus, it is seen that Turkey is ranked third in the world in terms of the dry onion consumption per capita and is over the world average.

Problems Encountered in Dry Onion Production and Foreign Trade in Turkey

One of the most important problems encountered in onion production is the fluctuations in the production. The fluctuations in the production cause greater fluctuations in onion prices and it would harm producers in large quantities for some years. Producers often decide how much to produce as considering the prices in the previous production period. The onion production is occurred in more areas when the prices in the previous production period are high. On the other hand, the production is made in less area when the prices are low. Consequently, producers suffer when the production is excessive and consumers suffer, in case it is low. Therefore, it is necessary to do production planning to avoid this situation.

Producers could not economically organize enough. Thus, they are faced with serious issues particularly at the stage of input supply and product marketing. For this reason, it is important that the producers organize in the form of producer associations or cooperatives.

Products cannot be provided in the appropriate quality and standards for the foreign market demands. Therefore, an attention should be especially given to the contract production and a sufficient amount of variety should be provided in accordance with the wishes of the international markets. In this regard, the cultivation of resistant varieties should be provided as doing reclamation work and should be encouraged.

Produced onions cannot be stored in the cold storage facility under suitable conditions. For this reason, the losses occur in nearly 20% of the production due to the reasons such as decaying, sprouting and withering. A sufficient number of suitable cold storage facilities are required in the regions having intensive production to overcome these losses.

Especially in recent years, pink root rot disease has led to a large amount of yield losses in dry onion production. The disease occurs inside the soil. The disease resistant varieties should be chosen and the crop rotation should be applied. It is very important that the crop rotation should be performed on the dry onion because it is a tuber plant. An increase will be observed in the onion yield when the onions plant after the legumes. Education and extension activities should be increased to inform consumers on these issues.

CONCLUSIONS

The study examined the development of dry onion production and foreign trade in Turkey and in the world during the 1996-2013 period. In the

examined period, 1.7-fold, 1.9-fold and 1.2-fold increases were obtained respectively in the world dry onion production area, production and yield. In the same period, whereas there were 39% and 13% decreases respectively in the production area of dry onion and the production in Turkey, approximately 1.4-fold increase occurred in the yield. Ireland is ranked number one and South Korea is ranked number two in the yield of world dry onion while India and China are ranked first two in the production area and production. It is determined that Turkey is ranked number 12 (1.45%) in the dry onion production area, number six in the production in the world and is over the world average (21.07 ton/ha) in the yield. India, the Netherlands and China are in the top three in the world dry onion export and Turkey is ranked number 10 with a share of 2.25%. Regarding the world dry onion import, Malaysia, the USA and England are the top three countries. Turkey is not a dry onion importing country.

Turkey is ranked third in terms of the dry onion consumption while Algeria is ranked first. The major issues faced in the dry onion sector in

Turkey can be listed as the extreme fluctuations in the production and price, the lack of economic organization, not to produce in the appropriate quality and standards for the foreign market demands, and the lack of cold storage facilities under suitable conditions.

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