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Characterization of potato production, marketing, and utilization in North Western Amhara Region, Ethiopia

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Characterization of potato production, marketing and utilization were undertaken in four zones of North Westren Amhara Region namely West Gojjam, East Gojjam, South Gonder and Awi based on their potato production on 158 farmers in 2010 to 2011. The main objective of the study was to characterize and document as well as to assess the challenges of existing potato production, marketing and utilization systems based on primary and secondary data. Potato is mainly produced in main, residual and irrigation production seasons in the study zones. Farmers plow their potato farm at least four times before planting and cultivate two to four times. They use an average potato seed tuber rate of about 2.008 tons per hectare. Farmers use local potato varieties for a long period of time and their average productivity is only 7.26 ton per hectare in main season production, and only 21.5% of farmers use improved potato varieties. Potato seed sources for farmers' are own production, market, research and Agriculture office. About 75% of the sample farmers store ware potato after harvest for about 3.84 months using floor, raised bed *("kott")*, and in the soil. Half of the potato produced are consumed at home while the rest are reserved for seed and sold. Farmers consume potato in the form of boiled and stew. Major constraints of potato production include disease, soil nutrient depletion, moisture stress, frost, pest, lack of improved varieties, water shortage and lack of market access.

Key words: Potato, characterization, production, consumption.

INTRODUCTION

Potato (*Solanum Tuberosum* L.) was originated in the central high lands of the Andes in South America and was brought to Europe in the 16th century. The crop was introduced to Ethiopia in 1859 by a German Scientist called Schimper (Pankrust, 1964). Since then it was limited to homestead as a garden crop and gradual rise in production occurred at the end of 19th century, when there was a long famine in Ethiopia (Gebremedhin et al., 2008).

Potato is one of the major food and cash crop in Ethiopia especially in the high and mid altitude areas. It is among the leading vegetable crops in Ethiopia. About 164,146 hectare of land was covered by potato and more than 940,209 tones were produced in Ethiopia in 2001

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Table 1. The description of the study districts.

Districts	Major characteristics					
	Total area (ha)	Total Population (2006/07)	Altitude (masl)	Rainfall (mm)	Temperature (°C)	Total kebeles
Yilmana Densa	99,180	287,417	1800-3200	1052-1488	8.8- 25.2	36
Quarit	61,473	158,349	NA	NA	NA	29
Gozamin	121,807	152,309	NA	NA	NA	26
Sinan	38,640	111,975	NA	NA	NA	17
Farta	107,077	256,515	1920-4235	1250-1599	9 - 25	39
Lai-gaint	154,866	243,344	NA	600-1250	4 - 24	33
Banja	45,618	98,501	NA	NA	NA	26
Guagusa-shikudad	30,432	97,286	NA	NA	NA	14

Source: BoFED, 2011; ANRS 2007 and respective district bureaus of agriculture and rural development. NA=Data not available.

(Tesfaye, 2008). On average, a total of 2,310,035 households were supported by potato during the aforementioned period (CACC, 2003b). This evidently reveals the importance of the crop in the country.

Potato is also one of the widely grown food as well as income generating crop in the Amhara National Regional State (ANRS) (ANRS, 2007 and 2008). It is important in the farming system in mitigating hunger during food shortage months (July to September). This region takes the largest areas of land put under potato production accounting for 43.25% with 71,000 hectare and 338,781 tones of potato produce (CACC, 2003a). Potato constituted 91.16% area coverage and 76.88% volume of production of regional area under root crops and it is grown in almost all areas of the region.

Therefore, latest and full-fledged information on overall potato production, utilization, and marketing and its challenges is very pertinent for the future direction of potato research and development at national level in general and regional level in particular. Hence, this study was initiated to fill this gap with the objective of identifying and characterizing the existing potato production, marketing and utilization systems and to assess the challenges associated with it.

METHODOLOGY

Sampling procedure, data collection and analysis

The study was undertaken in four zones of Amhara Region namely West Gojjam, East Gojjam, South Gonder and Awi in 2010 to 2011. Yilmana Densa and Quarit from West Gojjam, Gozamin and Sinan from East Gojjam, Farta and Lai-gaint from South Gonder and Banja and Gaugusa-shikudad districts from Awi were selected on the basis of their large potato production area coverage and representativeness of the farming system. Then, a two stage random sampling procedure was used to select kebeles and farmers for the study. Based on this, 15 kebeles and 158 farmers were selected for the interview. Data was collected from both primary and secondary sources. All sets of data were subjected to SPSS computer software and descriptive statistics such as mean, standard deviation and frequency were used to analyze the collected data.

Description of the study areas

The study districts and their characteristics are presented in Table 1.

RESULTS AND DISCUSSION

Demographic characteristics

As indicated in Table 2, the average age and total family size of sampled household head for all the study zones was 43 and 6.44 with a standard deviation of 12.3 and 1.85, respectively.

Socio-economic characteristics

Land

The average farm size of the respondent farmers in the study zones was about 1.12 hectare of land and average cultivated, grazing, and fallow lands were 0.99, 0.11 and 0.01 hectares, respectively as shown in Table 3.

Crop production pattern of the study zones

Almost 99.4% of the respondent farmers in the study zones produce potato in main season while 34.18 and 17.09% of the sampled farmers produce potato in irrigation and residual production seasons, respectively. As indicated in Table 4, major crops grown include wheat (63.9%), barley (73.4%), tef (36.1%), maize (32.9%) and faba bean (51.3%). The mean area allocated in hectare is 0.32, 0.34, 0.38, 0.27 and 0.21 in that order.

Potato production systems and seasons

Potato is produced in main, residual and irrigation

Table 2. Family size and structure of the study areas (N=158)

Descriptions	West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
	Mean	Stdv	Mean	Stdv	Mean	Stdv	Mean	Stdv	Mean	Stdv
Age of household	37.5	11.1	43.5	9.57	44.1	14.1	45.3	11.2	43	12.3
Total Family size	6.1	2.1	6.7	1.9	6.1	1.8	6.8	1.7	6.4	1.85

Source: Own survey data (2011).

Table 3. Land holding (hectare) of farmers in the study areas (N=158)

Farm size (ha)	West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
	Mean	StDv	Mean	StDv	Mean	StDv	Mean	StDv	Mean	StDv
Total farm size	0.92	1.63	1.14	1.89	1.19	1.92	1.15	1.80	1.12	1.85
Cultivated land	0.81	1.25	1.09	1.87	1.05	1.82	0.94	1.58	0.99	1.64
Grazing land	0.07	0.40	0.05	0.35	0.09	0.53	0.20	0.77	0.11	0.59
Garden area	0.03	0.38	0.01	0.04	0.00	0.00	0.00	0.00	0.01	0.17
Fallow land	0.02	0.54	0.0	0.00	0.01	0.07	0.02	0.35	0.01	0.30

Source: Own survey data, 2011. StDv = standard deviation.

production seasons in the study zones. These production seasons allow potato produced to appear throughout the year. Main season potato production is preferred by farmers due to the fact that potato will mature and reach for them in time of food shortage (June to August) while irrigation potato production is advantageous for less late blight stress, good market demand and more yields. The major potato production method in main season is sole cropping but there is a practice of intercropping potato with maize, and to some extent with lupine. Sowing faba bean, field pea and linseed crops on potato field towards the maturity stage is also common practice in the study areas. Potato is commonly rotated with barley, wheat, faba bean, maize, and tef fields.

Summary of time of land preparation, planting and harvesting of potato in main, residual and irrigation production seasons is given in Table 5.

Potato agronomic practices

Average frequency of potato land preparation for all the study locations is about 4.35 times. Among the study zones, farmers of Awi zone plow their potato field more than other zones (on average 6.65 times when compared to 3.65, 3.76 and 3.40 times of West Gojjam, East Gojjam and South Gonder zones, respectively). Residual potato production season needs less frequency of land preparation than main and irrigation seasons since potato is planted immediately after harvesting of main season crops mainly barley. Farmers used row planting and closer spacing in irrigation production season to conserve moisture. Farmers weed, hoe and earth up their potato field 2 to 4 times (averagely 2.78 times) after about 4 weeks of planting as indicated in Table 6.

Input utilization

As indicated in Table 7, average seed rate of farmers for potato for all the study zones is about 2.008 tons per hectare. Commercial fertilizer was used by 96.8, 3, 17 and 30% of the sampled farmers in West Gojjam, East Gojjam, South Gonder and Awi Zones, respectively in main season potato production. The average amount of Di-ammonium phosphate (DAP) and urea fertilizer applied in kilograms per hectare in main season potato production was 116.52 and 98.24 with standard deviation of 14.80 and 12.50 respectively as showed in Table 7. In the study zones, 33.1, 13.8 and 39% of the sampled farmers use commercial fertilizer in main, residual and irrigation potato production seasons, respectively. Farmers use more fertilizer in main and irrigation than residual production seasons.

Area allocation and productivity of potato

In main, residual and irrigation seasons, 98, 18.4 and 37.3% of the sample farmers for the study zones produce local potato varieties by allocating an average area of 0.27, 0.15 and 0.14 ha, respectively as shown in Table 8.

Table 4. Major crops grown and area allocated (in hectare) in the study areas (N=158).

Crops	West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
	Frequency (%)	Mean (Stdv)	Frequency (%)	Mean (Stdv*)	Frequency (%)	Mean (Stdv)	Frequency (%)	Mean (Stdv)	Frequency (%)	Mean (Stdv)
Potato (main season)	31 (100)	0.295 (0.69)	33 (97.1)	0.208 (0.36)	53 (100)	0.333 (0.74)	40 (100)	0.348 (1.05)	157 (99.4)	0.303 (0.79)
Potato (residual)	5 (16.1)	0.163 (0.34)	7 (20.6)	0.143 (0.31)	0	0	15 (37.5)	0.138 (0.36)	27 (17.09)	0.143 (0.33)
Potato (irrigation)	8 (25.8)	0.165 (0.30)	14 (41.1)	0.128 (0.30)	14 (26.4)	0.188 (0.50)	18 (45)	0.135 (0.42)	54 (34.18)	0.148 (0.40)
Wheat	21 (67.7)	0.303 (0.56)	20 (58.8)	0.395 (1.17)	41 (77.4)	0.263 (0.48)	19 (47.5)	0.403 (1.02)	101 (63.9)	0.323 (0.82)
Barley	24 (77.4)	0.293 (0.63)	25 (73.5)	0.455 (1.07)	35 (66)	0.343 (0.89)	32 (80)	0.285 (0.63)	116 (73.4)	0.340 (0.85)
Tef	7 (22.6)	0.285 (0.63)	11 (32.4)	0.410 (0.50)	7 (13.2)	0.448 (0.81)	32 (80)	0.368 (1.19)	57 (36.1)	0.375 (0.99)
Maize	20 (64.5)	0.320 (0.91)	7 (20.6)	0.178 (0.37)	8 (15.1)	0.283 (0.79)	17 (42.5)	0.250 (0.35)	52 (32.9)	0.273 (0.69)
Faba bean	18 (58.1)	0.213 (0.52)	21 (61.8)	0.198 (0.36)	35 (66)	0.210 (0.35)	7 (17.5)	0.250 (0.58)	81 (51.3)	0.21 (0.41)
Field pea	2 (6.5)	0.408 (1.95)	3 (8.8)	0.163 (0.30)	3 (5.7)	0.208 (0.29)	8 (20)	0.158 (0.23)	16 (10.1)	0.198 (0.64)
Triticale	0	0	2 (5.9)	0.125 (-)	13 (24.5)	0.405 (1.10)	0	0	15 (9.5)	0.368 (1.09)
Linseed	0	0	1 (2.9)	0.113 (-)	17 (32.1)	0.205 (0.39)	1 (2.5)	0.25 (-)	19 (12)	0.203 (0.38)

Source: Own survey data (2011).

Table 5. Potato production calendars of respondents in the study areas.

Descriptions	Main season	Residual	Irrigation
Time of land preparation	November to February	August to September (June to August in Awi zone)	September to November
Planting date	March (some in April)	August/September	November to January
Harvesting Date	July to September	December to January	February to May

Source: Summary of own survey data (2011).

Table 6. Agronomic practices.

Description		West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Frequency (%)	Mean (Std. Dev.)
Frequency of land preparation	Main season	3.65	0.76	3.76	1.39	3.40	1.45	6.65	1.86	157 (99.4)	4.35 (1.98)
	Residual season	2.14	0.69	2.64	1.03	0	0	6.23	1.83	27 (17.1)	4.24 (2.40)
Hoeing and earthing up frequency		3.03	1.10	2.67	0.48	2.85	0.57	2.60	0.55	157 (99.4)	2.78 (0.69)
Man days required per timad		40.76	8.85	24.36	1.63	32.28	5.60	28.00	4.07	141 (89.2)	31.20 (5.71)
Cost of labor/day		14.32	3.79	17.14	3.44	17.75	3.05	16.30	3.77	91 (57.6)	16.46 (3.68)

Source: Own survey data, 2011.

Table 7. Seed rate and amount of fertilizer used by farmers (qt/ha).

Descriptions		West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Seed rate		1.82	0.85	1.86	1.16	1.92	1.34	2.39	1.69	2.01	1.523
Fertilizer	**Seasons**										
	Main	119	17.7	140	12.9	119	10.1	102	12.3	117	14.80
DAP	Residual	51.0	8.66	8.00	-	0	0	80.0	0.00	53.2	8.60
	Irrigation	125	16.5	101	14.7	100	-	63.7	8.31	104	15.00
	Main	75.0	7.22	85.0	12.4	118	16.2	93.3	10.7	98.2	12.50
UREA	Residual	20.0	-	0	0	0	0	80.0	-	50.0	10.61
	Irrigation	75.0	19.7	56.7	10.1	52.0	-	47	9.60	60.0	13.38

Source: Own survey data (2011).

Table 8. Area allocated for local and improved potato varieties (hectare).

Area planted (hectare)		West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
		Freq (%)	Mean (Std)	Freq (%)	Mean (Std)	Freq (%)	Mean (Std)	Freq (%)	Mean (Std)	Freq (%)	Mean (Std)
	Main	31 (100)	0.32 (0.69)	33 (97.1)	0.20 (0.36)	52 (98)	0.30 (0.55)	39 (98)	0.27 (1.08)	155 (98)	0.27 (0.73)
Local	Residual	7	0.21 (0.58)	7 (20.6)	0.14 (0.31)	0	0	15 (37.5)	0.13 (0.33)	29 (18.4)	0.15 (0.41)
	Irrigation	13 (41.9)	0.68 (0.48)	13 (38.2)	0.44 (0.21)	15 (28.3)	0.14 (0.28)	18 (45)	0.22 (0.42)	59 (37.3)	0.14 (0.37)
	Main	0	0	2 (5.9)	0.07 (0.32)	13 (24.5)	0.20 (0.74)	18 (45)	0.178 (0.43)	33(20.9)	0.18 (0.57)
Improved	Residual	0	0	0	0	0	0	1 (2.5)	0.125 (-)	1 (0.6)	0.13 (.)
	Irrigation	0	0	2 (5.9)	0.13 (0.00)	0	0	2 (5)	0.10 (0.18)	4 (2.53)	0.11 (0.13)

Source: Own survey data (2011).

On the other hand, 20.9 and 2.53% of the sampled farmers produced improved potato varieties by allocating about 0.18 and 0.11 hectares of land in main and irrigation seasons, respectively. Average productivity of local potato varieties was about 7.26, 5.94 and 7.92 tons per hectare in main, irrigation, and residual production seasons, respectively. Meanwhile average productivity of improved potato varieties under farmers' conditions is about 14.52 and 2.40 tons per hectare in main and irrigation production seasons, respectively. Of course, the yield obtained in irrigation season may not be representative, because the respondents (producers) are only 2 (1.27%) farmers from Awi zone.

Experience of farmers about potato varieties

Farmers use local potato varieties starting from a long period of time. Improved varieties are not commonly found in the hands of the farmers. As indicated in Table 9, it is only about 3 years that improved potato varieties are used by and only 21.5% of all the sampled farmers use improved potato varieties.

Local potato seed tuber sources of 57% from the sampled farmers are their own production while 39.9% is purchase from the market. More number of farmers from East Gojjam and South

Table 9. Use of improved potato varieties by farmers.

Varieties used		West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
		Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Used improved varieties	Yes	0	0	2	5.9	13	24.5	19	47.5	34	21.5
	No	31	100	32	94.1	40	75.5	21	52.5	124	78.5
	Total	31	100	34	100	53	100	40	100.0	158	100

Source: Own survey data (2011).

Table 10. Potato storage intensity and ware potato storage methods.

Descriptions	West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
	Frequency	%	Frequency	%	Frequency	%	Frequency	%	Frequency	%
Do you store ware potato?										
Yes	19	61.3	23	71.9	47	88.7	25	69.4	114	75.0
No	12	38.7	9	28.1	6	11.3	11	30.6	38	25.0
Storage type										
Floor	8	40.0	1	4.0	8	17.8	9	33.3	26	22.2
Kott	6	30.0	23	92.0	25	55.6	12	44.4	66	56.4
In the soil	4	20.0	1	4.0	12	26.7	4	14.8	21	17.9
Floor, kott and in the soil	0	0	0	0	0	0	1	3.7	4	3.5
Months of own produce storage	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
	2.21	1.34	5.23	2.26	3.03	2.13	5.40	2.14	3.84	2.39

Source: Own survey data, 2011.

Gonder zones uses their own production of local potato seed (78.8% and 63.5% respectively) than West Gojjam and Awi zones (29 and 48.7%, respectively). 52.9% of the total sample farmers get improved potato seeds from Adet Agricultural Research Center and 38.2% purchase from their neighbours. *Ater Abeba/Key Abeba/Demie* local potato variety is the dominant variety grown in all the study zones followed by *Aballo* and *Shikuarrie*.

Harvesting and storage

Among 158 respondent farmers, 75% of them (61, 72, 89 and 69% in West Gojjam, East Gojjam, South Gonder and Awi zones, respectively) store ware potato after harvest for about 3.84 months (2.21, 5.23, 3.03 and 5.4 months in that same order). Storage methods of the sample farmers for ware potato produce are floor (22.2%), raised bed ("*kott")* (56.4%), in the soil (17.9%) and floor, kott and in the soil (3.5%) as shown in Table 10.

Potato marketing

Marketing of ware potato produce

Average total quantity of potato produced,

Table 11. Potato production, consumption and marketing.

Quantity of potato (ton)		West Gojjam (N=31)		East Gojjam (N=34)		South Gonder (N=53)		Awi (N=40)		For all locations (N= 158)	
		Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev	(%)	Mean (Std. Dev)
2010	Total quantity produced	2.48	1.51	1.84	1.4	2.61	2.20	2.07	1.79	95	2.29 (1.84)
	Reserved for seed	0.82	0.52	0.42	0.3	0.61	0.39	0.66	0.53	80	0.62 (4.44)
	Consumed at home	1.30	0.89	1.12	0.9	1.35	1.17	1.18	1.01	91	1.25 (10.17)
	Sold	0.52	0.46	0.44	0.5	1.06	0.92	0.98	1.32	68	0.80 (9.00)
	Price (ETB/kg)	0.71	0.33	0.51	0.2	0.81	0.75	2.02	1.61	67	0.98 (10.37)
2011	Total quantity produced	2.74	2.04	1.75	1.6	2.47	19.0	2.07	1.74	97	2.27 (17.66)
	Reserved for seed	0.81	5.1	0.43	2.6	0.55	3.92	0.72	5.32	84	0.62 (4.46)
	Consumed at home	1.31	6.9	1.08	7.5	1.26	9.37	1.06	8.64	94	1.18 (8.32)
	Sold	0.90	1.34	0.42	3.9	1.11	1.01	1.13	13.6	62	0.92 (11.03)
	Price (ETB/kg)	1.08	3.35	1.25	4.5	1.35	85.8	3.33	19.1	62	1.69 (135.03)

Source: Own survey data (2011).

Table 12. Percent of potato for consumption, seed and sale

Year	Potato produce for	West Gojjam (%)	East Gojjam (%)	South Gonder (%)	Awi (%)	For all locations (%)
2010	Seed	30.8	20.8	19.6	22.5	22.7
	Consumption	52.6	60.6	50.4	50.2	52.4
	sold	16.6	18.6	30.0	27.3	24.9
2011	Seed	27.7	22.3	20.6	24.6	23.3
	Consumption	47.8	61.7	48.6	47.3	50.2
	sold	24.5	16.0	30.8	28.1	26.5

Source: Own survey data (2011).

reserved for seed, consumed at home and sold at the market per farmer in 2010 for all locations was 2.29, 0.62, 1.25 and 0.79 tons, respectively. In addition, it was 2.27, 0.62, 1.18, and 0.92 tons in 2011 in that same order. The average price per ton of potato was 9.81 and 16.96 Ethiopian Birr (ETB) in 2010 and 2011, respectively as showed in Table 11. Percentage of potato reserved for seed, consumed at home and sold over all locations was 22.7, 52.4 and 24.9%, respectively in 2010 and was 23.3, 50.2 and 26.5% in 2011 in that same order. Relatively, more potato produce is consumed in East Gojjam zone than others. It can be concluded that, in the study areas, half of the potato produced is consumed at home and the rest half is reserved for seed and sold at the market for cash able as indicated in Table 12.

Potato market customers

Market customers of potato farmers in these markets are whole sellers, retailers, farmers and

Table 13. Summary of major constraints.

Production constraints	Input utilization	Storage	Marketing	Utilization
Disease (Bacterial Wilt* and Late Blight), hail damage, soil nutrient depletion, moisture stress, frost pest, etc.	**Lack of improved varieties** - Availability - Price **Commercial fertilizer** -Time and cost **Chemical for late blight control** -awareness -availability	**Lack of awareness and cost of storage for** -Ware and -Seed potato **Major problems:** -decay/sprouted -discolored/weight loss	-Loss due to perishability - Price drop after harvest - Market farness - lack of information - Limited traders. - Infrastructures problem	Farmers utilize potato only in the form of boiled and stew

*Potato Bacterial Wilt (as nicknamed by farmers as "AIDS" or"Akrir") is very common in Awi and East Gojjam zones). Source: Own survey data, 2011.

urban consumers and farmers' assemblers. Non-governmental organizations (NGOs), Agriculture office and farmers are customers of potato farmers that produce seed potato tubers.

Market information and grading potato for sale

Farmers' means of getting information about potato price are their neighbours, the market and traders. Agriculture office is the main source of information for farmers for seed potato marketing. Most of the respondent farmers do grade potato for sale based on tuber size, colour, health, maturity stage of tubers and combination of these characters.

Potato utilization

The most common potato dishes prepared locally by farmers are in the form of boiled and stew ("wott"). Farmers of the study zones consume potato mostly in boiled form. Nowadays, potato consumption has expanded and includes chips, crisps, and mixture preparations with other vegetables that are becoming popular in urban areas. More potato is consumed in East Gojjam and Awi zones than West Gojjam and South Gonder. Potato is consumed from July to September because these seasons are seasons of potato maturity as well as time of food shortages-"months of hunger" in rural part of Ethiopia.

Major constraints of potato productions

Major constraints of potato production can be summarized as production, input utilization, storage, marketing and utilization problems and the summary is given in Table 13.

CONCLUSION AND RECOMMENDATION

Emphasis should be given for potato varietal improvement that are high yielding, disease tolerant, early maturing, good in nutritional quality and good in storage life. Demonstration, popularization and Scaling up of improved potato varieties on farmers' field that was started in 2006 by Adet Agricultural Research Center should be continued so as to maintain good results obtained in some intervention areas. This demands great effort of Agricultural Research and Extension bodies to promote and scale up the improved potato varieties with their full packages to the farmers.

Potato seed tuber system needs improvement. Most farmers are aware about improved potato varieties but they couldn't get them due to unavailability and high price. There is no legal government or non governmental body that multiplies and disseminates these varieties like other cereal crops. This demand creating potato seed growers/producers farmer groups in high land areas of each zone.

Promoting and giving training about cultural management (rogging, crop rotation, etc) for the control of bacterial wilt is a current pressing issue for potato research and development. Nowadays, Potato Bacterial Wilt is becoming a major limiting

factor for potato production. Recently, pesticides like Redomil for the control of potato Late Blight are being recommended as a package of production and one to three spray prevents potato field from late blight damage. Meanwhile, almost all farmers do not spray chemical for late blight control due to lack of awareness about it. Hence, it is high time of awareness creation about pesticides for the control of potato late blight.

Demonstration of improved potato storage structures (Diffused Light Store for seed potato and improved ware potato house) is another important task to be done in order to minimize losses due to storage. Due to storage problems, farmers are forced to sell their produce early and buy potato seed tubers annually of unknown source.

Awareness creation on different forms of potato utilizations like pancake (injera), bread, porridge, kinche, chips, crisps, etc. is important to widen food items of farmers.

Conflict of Interests

The authors have not declared any conflict of interests.

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