The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
http://ageconsearch.umn.edu
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

ISSN: 2224-0616
Int. J. Agril. Res. Innov. Tech. 12(2): 53-55, Dec 2022
DOI: https://doi.org/10.3329/ijarit.v12i2.64085
OPEN ACCESS
Available online at https://ijarit.webs.com
https://www.banglajol.info/index.php/IJARIT

Registration of newly released fenugreek (*Trigonella foenum-graecum*) variety Arganne for mid altitude of Bale, South Eastern Ethiopia

Getachew Asefa* and Mohammed Beriso

Received 17 August 2022, Revised 10 November 2022, Accepted 22 December 2022, Published online 31 December 2022

A B S T R A C T

Arganne with the accession name Acc. 202209sno3-5) is a fenugreek variety released by Oromia Agricultural Research Institute, Sinana Agricultural Research Center, Ethiopia in 2021. The trial was conducted at Sinana Agricultural Research Centre from observation nursery to preliminary yield trial and promising fenugreek genotypes were selected from yield trial based on seed yield and reaction to diseases, especially powdery mildew. These promising genotypes were evaluated against standard check Hunda'ol and Ebisa across three locations for three consecutive years (2017 to 2019). Arganne showed superior yielding ability, producing a mean seed yield of 17-26 Qt ha^{-1} on the research field and 15-21 Qt ha^{-1} on the farmers' field. The seed yield of the new variety exceeded that of the standard check Hunda'ol and Ebisa varieties by about 12.00% and 11.23%, respectively.

Keywords: Fenugreek, Variety Verification, Registration

Sinana Agricultural Research Center, P.O. Box 208, Bale- Robe, Ethiopia

*Corresponding author's email: fenetgeach@gmail.com (Getachew Asefa)

Cite this article as: Asefa, G. and Beriso, M. 2022. Registration of newly released fenugreek (*Trigonella foenum-graecum)* variety Arganne for mid altitude of Bale, South Eastern Ethiopia. *Int. J. Agril. Res. Innov. Tech.* 12(2): 53-55. https://doi.org/10.3329/ijarit.v12i2.64085

Introduction

Fenugreek (*Trigonella foenum-graecum* L.) is produced as spice, medicinal, animal feed and as pulse crop for rotation and mainly for export, which is used for sustains livelihoods incomes and earning foreign exchange. As a medicinal herb, the seed of fenugreek is an official drug according to the European dispensatories. Almost all farmers in some parts of Ethiopia like 'Hararghe' use fenugreek in the major food called 'Lafiso' which is either made from maize or sorghum 'Injera' served as baked in mixture of fenugreek flour boiled either with meat or alone. The 'Harari' people also use fenugreek as their best dish known as 'Hulbat Meraq' where they use fenugreek cooked with meat, mixed with 'Injera' (Abdulahi, 1998). The production and distribution of fenugreek in Ethiopia is nearly similar to those of other cool season food legumes (Fikreselassie *et al.*, 2012). Fenugreek stands as generating cash in study area. Thus, improving this crop means opening a new market opportunity in the face of the ever-expanding world trade for the country in general and for the resource-poor farmer in particular. One additional advantage of fenugreek is the wide variety of its uses at different crop stages such as green manuring, leaf vegetable and seed production for the international market of spices

Fenugreek is the major seed spices produced in Bale mid altitude viz., Gindhir, Goro, Gololcha and some part of sawwena and Sinana districts. However, its production and productivity is low. Among the factors contributing to low production and productivity, even if many varieties were released before, high yielding and resistance/tolerant to disease with wide adaptability results in low yield. Hence, the objectives of the study is to register released fenugreek variety that are high yielding and adaptable to bale mid altitude and similar agro ecologies.

Materials and Methods

Varietal origin/pedigree and evaluation

'Arganne' with the accession name of **(**Acc. 202209sno3-5) is landrace material, which collected from Arsi Bale and developed through selection. 75 genotypes were evaluated at Sinana Agricultural research centre from observation nursery to preliminary yield trial. 14 fenugreek genotypes were selected from yield trial based on seed yield and reaction to major fenugreek diseases. These promising genotypes were evaluated against standard check Hunda'ol and

 An open access article under CC BY

Ebisa, which was released from Sinana Agricultural Research Centre across three locations (Sinana, Goro and Gindhir) for three consecutive years (2017 to 2019). Promising genotypes and standard checks were planted on 10 x 10 m² at nine environments for variety verification trial in 2020 and evaluated by Ethiopian Variety Releasing Committee, finally Arganne approved as superior Variety for Bale mid lands and similar agro ecologies.

Results and Discussion

The combined mean of total seed yield of genotypes across environment ranged from 21.36 to 11.92 Qt ha^{-1} (Table 3). The highest means of seed yield was recorded from genotypes 202209sno3-5 followed by 201612sno3-2 were 21.36 and 20.60 Qt ha^{-1}, respectively. The lowest total seed yield was obtained from local checks (11.90 Qt ha^{-1}). The two high seed yield genotypes have yield advantage of 11.23 and 8.25% over standard check ebisa. This is in agreement with Beriso *et al.* (2016) who reported the candidate genotype has yield advantage 27.98%, and 6.18% over the two standard checks Chala and Hunda'ol, respectively.

The highest mean seed yield was recorded from Sinana 2018 followed by Goro 2019, which is 24.23 and 22.80, respectively (Table 2) while the lowest mean seed yield was scored from Ginnir 2019. This may be due to variability of the environment and environment can affect the seed yield of fenugreek than genotypes. This is in agreement with Fikreselassie (2012), who reported out of the traits considered in the experiment except thousand seed weigh, all showed significantly maximum value among the tested accessions.

Morphological characteristics of arganne

The released variety Arganne exhibited congenial morphological and agronomic characteristics compared to the standard check Hunda'ol and Ebisa. It has deep green foliage, yellow seed colour and a medium of day to flowering, days to maturity and plant height (46.17, 121.22 and 65.42 cm), respectively (Table 1).

Yield performance

Arganne (Acc. 202209sno3-5) showed superior yielding ability, producing a mean seed yield of 17- 26 Qt ha^{-1} at research field and 15 – 21 Qt ha^{-1} on farmers' field. In fact, the seed yield of the new variety exceeded that of the standard check Hunda'ol and Ebisa variety by about 12% and 11.23%, respectively.

Adaptation and agronomic recommendation

Arganne is fenugreek variety released for Bale midlands, southeastern Ethiopia. It is well adapted in similar agro ecologies with altitude of 1650-2400 m.a.s.l with annual rainfall of 550-750 mm. Recommended fertilizer rate for Arganne is 100kg of NPS, which is applied at planting while the spacing between rows is 30 cm.

Table 1. Agronomic and morphological descriptors for newly released fenugreek variety.

Variety Name	Arganne (Acc . 202209sno3-5)
Agronomic and morphological characteristics	
Adaptation area	Sinana, Goro, Ginnir and similar agro ecology
Altitude (masl)	1650 – 2400
Rain fall (mm)	550-750
Seed rate (kg ha^{-1})	Row planting -20
	Broadcasting - 25
Planting date	End of August to late September (for Bale mid altitude)
Fertilizer rate (kg ha^{-1})	NPS = 100
Days to flowering	46.17
Days to maturity	121.22
Plant height (cm)	65.42
Growth habit	Erect
Seed color	Yellow
Flower color	White
Yield (Qt ha^{-1})	
Research field	17-26
Farmers field	15-21
Year of release	2021
Breeder/maintainer	SARC/IQQO

Table 2. Means of seed yield (Qt ha^{-1}) of 14 fenugreek genotypes across location and years.

	Sinana		Goro		Gindhir		
Genotype	2018	2019	2018	2019	2018	2019	Grand Means
201612sno3-2	31.15	22.15	15.64	21.23	21.23	11.14	20.60
202209sno3-5	24.83	24.40	17.85	24.50	24.50	19.32	21.36
202216sn3-2	28.51	25.76	19.87	24.65	26.14	17.39	20.45
220024sno3-4	28.83	10.74	12.43	22.90	22.90	11.89	16.81
220024sno3-7	24.39	20.83	16.34	24.70	24.70	16.01	20.03
220025sno3-3	27.15	18.50	13.93	27.77	27.77	12.56	19.25
228246sno3-3	26.00	18.90	14.26	26.37	26.37	13.96	19.21
238246sno3-1	24.15	21.63	14.54	25.90	25.90	14.17	19.43
53063sno3-1	23.71	19.15	18.58	22.43	22.43	17.21	20.49
53097sno3-3	25.74	17.63	17.61	24.10	24.10	16.17	20.30
53102sno3-2	21.13	11.00	14.26	21.56	21.56	11.23	16.56
Ebisa	20.41	20.33	17.33	19.59	19.59	12.50	18.96
Local	14.00	10.03	11.31	12.07	12.07	11.87	11.92
Hunda'ol	20.89	17.77	14.24	17.12	17.12	14.91	16.62
Mean	24.23	18.41	15.55	22.80	22.69	14.64	18.90
CV (%)	20.80	34.30	21.40	14.70	23.90	14.90	23.90
LSD	8.47	10.60	5.40	3.20	9.11	4.24	2.96

Table 3. Summary of mean yield and other agronomic traits on the promising fenugreek genotypes.

Genotypes	DF	DM	PH	PB	SB	PP	SP	BM	SY
201612sno3-2	55.28	132.83	63.56	3.76	1.57	9.96	13.01	44.49	20.60
202209sno3-5	39.17	120.22	65.42	3.41	1.67	9.69	13.86	46.36	21.36
202216sn3-2	56.94	133.56	66.08	3.13	1.33	8.32	13.04	43.11	20.45
220024sno3-4	55.72	132.78	62.44	3.71	1.83	9.57	12.61	43.63	16.81
220024sno3-7	55.06	133.22	64.10	3.54	1.73	9.42	14.05	46.56	20.03
220025sno3-3	56.94	135.11	66.58	3.59	1.27	9.11	13.30	45.54	19.25
228246sno3-3	55.17	133.50	64.06	3.47	1.41	10.43	12.48	41.71	19.21
238246sno3-1	56.17	126.89	66.16	3.30	1.57	9.32	12.93	35.55	19.43
53063sno3-1	55.56	135.94	64.52	3.64	1.79	11.28	12.99	45.34	20.49
53097sno3-3	56.39	135.22	63.04	3.71	1.78	12.22	14.13	51.32	20.30
53102sno3-2	51.33	136.50	67.93	3.61	1.60	9.40	13.97	39.91	16.56
Ebisa	54.75	132.00	62.15	3.57	2.00	10.90	12.80	50.07	18.96
Local	55.94	135.39	69.43	3.34	1.47	9.28	12.90	42.53	11.92
Hunda'ol	57.33	133.94	65.60	3.76	1.76	10.08	13.27	45.90	16.62
Means	55.92	133.59	65.06	3.56	1.61	10.04	13.21	44.28	18.90
CV (%)	7.80	5.50	6.60	21.30	41.60	25.20	18.20	26.00	23.90
LSD	2.88	4.83	2.80	1.43	0.43	1.66	1.58	7.55	2.96

Note: DF=days to flower, DM=days to Maturity, PH=plant height, PB= primary branches/plant PP=Pod/plant, SB=secondary branches/plant, BMTH= biomass mass ton per hectare, and SY= seed yield Quintal per hectare.

Conclusion

The newly released fenugreek variety 'Arganne' was found to be superior to the commercial variety of Hundaol and Ebisa which were used as a standard check, in terms of seed yield and reaction to major fenugreek disease in the area (powdery mildew). The variety was also found to be stable over seasons and locations. It is, thus, concluded that, 'Arganne' fenugreek variety could be produced sustainably and profitably by smallholder farmers and investors in mid lands of Bale and similar agro ecologies in the country

Acknowledgements

The authors are acknowledged Oromia Agricultural Research Institute and Sinana Agricultural Research Center for financing and facilitate this research work to release fenugreek variety Arganne.

References

Abdulahi, J. 1998. Determination of spacing of fenugreek (*Trigonella foenum-graecum* L.) and effect of intercropping fenugreek with sorghum (*Sorghum bicolor* L., moench) on yield and soil nitrogen. M.Sc. Thesis, School of Graduate Studies of Alemaya University, Ethiopia.

Beriso, M., Mahadi, S., Worku, Y. and Asaffa, G. 2016. Registration of "Ebbisa" a Newly Released Fenugreek Variety for bale mid lands, Ethiopia. *J. Plant Sci.* 4(1): 13-16. https://doi.org/10.11648/j.jps.20160401.1

Fikreselassie. M. 2012. Performance of some Ethiopian fenugreek (*Trigonella foenum-graecum* L.) germplasm collections as compared with the commercial variety challa. *Pakistan J. Biol. Sci.* 15: 426-436. https://doi.org/10.3923/pjbs.2012.426.436

Fikreselassie, M., Zeleke, H. and Alemayehu, N. 2012. Genetic variability of Ethiopian fenugreek (*Trigonella foenum-graecum* L.) landraces. *J. Plant Breed. Crop Sci.* 4(3): 39-48. https://doi.org/10.5897/jpbcs11.078