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Review Article

Agronomy Practices of Anchote (Coccina Abyssinca L.) in Ethiopia. A Review

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ABSTRACT

Anchote is one of tuber crop grown in western and Southern western part of Ethiopia. It has content of mineral calcium, Phosphorus, Proteins, Starch and Antitoxic compound. It was used also as security crops against crop failure particularly in the western part of the country although it is economically important crop, little research were conducted Agronomic practices of the crop. The paper reviews the agronomic information regarding the production of the crop. Regarding the propagation method, using seed as a planting material is recommended than the tuber and still no variety was developed for the crop which indicates that the crop has given less attention inn research. A conducted research on intra and inter row spacing indicated that intra row of 10 cm and inter row of 40 cm produced better yield tuber yield .it was also reported that harvesting anchote at 7th month increased dry and fresh tuber yield. Generally there is lack of agronomic practices on rate of Tillage, seed rate, weed control and diseases and insect pest management, post-harvest facilities of the crop which indicates that more research should be conducted on agronomy of Anchote.

Key words: Anchote; Agronomic Practices; Research; Tuber yield

INTRODUCTION

Anclote [Coccina abysinica (Lam). Cogn] is one root and tuber crop grown widely in southern and southern west part of Ethiopia for Centuries. It belongs to family Cucurbitacae. Coccina abysinica is a perennial crop creeping herb whose tuber roots is used as food. Coccina contains 30 species among which eight is found in Ethiopia, among these Species Coccina abyssinca is the only edible tuberous roots and the young shoots are used as vegetable (Jeffers; Fekadu) [1-3].

It was known in different names in different parts of the country. It was named Anchote‘ in western and southern Western Oromia _Ushshe‘ in Wolayita _Ajo‘ in Keffa. The crop is grown in Wollega, Illubabaor, Jimma, and Southern Nations under traditional cropping system. The area covered by the crop in West Wollega zone is 30,000 ha with a production of 25,000 tonnes [4-5].

Anchote is one of the most favorite and cultural food with high mineral content of Calcium, Phosphorus, Proteins, Starch vitamins and antidoxin compound (Fekadu). It was reported that cooked and spiced anchote paste is recommended for people with fractured bones and displaced joints because of high protein and calcium content (Hora). It has Medicinal value, Engles and Howkes reported that the juice extracted from the tuber contains Saponin which is used to treat diseases like gonorrhea, tuberculosis and cancer [6-7].

Suitable altitude for Anchote production ranges from 1300 to 2400 m.a.s.l (Blilou). The requirement of soil PH ranges from acidic to neutral soil which is 4.5 to 7.5. The maximum and minimum temperature ranges from 12oc and 28 oc respectively while the annual rainfall requirement of Anchote is 800 mm to 1200 mm per year (Cheema) [8-10].

Girma and Dereje reported that Anchote can be grown with minimized inputs can produce reasonable yield under low soil fertility, acidic soil and drought condition. The crop is produced in home stead in east and west wollega zones and grown as security crops against crop failure. The crop relatively less susceptible to insect and diseases pest

Although the crop has significant importance to attain food security due to its drought resistance and ability to stay in the soil for a longer time, there is limited agronomic information

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regarding the crop. The crop didn't get enough focus in research activities regardless of its importance when comparing with other stable crop in the country [11].

Therefore the objective of the paper is:

- To review existing relevant agronomic information of Anchote production in Ethiopia.
- To identify future research area prospects of the crop

LITERATURE REVIEW

Morphological description and Nutrient Composition of Coccina Abyssinca

Coccina abyssinca belongs to the family of curcurbitacae. It has herbaceous vine like cucurbit with tendrils and usually requires staking for good seed production. The vine can grow up to 2 m height and produces many branches stems just as the base of the plant. (Girma and Hailu). Anchote production heart shape leaf with simple to deeply lobed with teeth along the margin and the lower side the leaf producing small nectar producing gland (Negash). It is monocious crop where the male flower is located in solitary or racemes and are located in the same plant (Holstein). It has oval shape fruit and flat smooth whitish seed in the fruit (Abera and Gudeta). The shape of tuber varies depending on the environmental conditions, they have spherical and elongates at maturity however based on the color of the tuber, and the tuber color might be white or red (Yosef and Tilaye) [12].

Agronomy of Coccina Abyssinca L.

Propagation Method and Variety Selection

Coccina can be propagated both vegetative and seed but propagation by seed is mostly used. It involves taking out seeds from red mature fruits and the fruits are macerated to separate seeds from the fleshy fruits and the seeds are mixed with wood ash and dried in the sun (Negash). The moisture content made subjective and for storage seeds are kept in either clay or wooden plot or wrapped in sheet of cloth (Meseret). Farmers sow Anchote seeds in April and May and harvesting in July and August (Girma and Dereje) [13].

Vegetatively, it is propagated from mother plant named —GUBOO‖ where some tubers are left in the soil for coming season ,however , the plants grown from the tuber might be attacked by diseases due to accumulation of fungi , bacteria ,virus and nematodes (Yosef and Tilaye) [14].

It was also reported that micro propagation is possible at laboratory level and research results have been reported (Kahia).

There is no variety developed or released so far for Anchote crop. There are criteria used for selection of desired anchote types like size of tuber traditionally (Desta). However exeperiments were conducted to compare the performance of 10 Anchote in Jimma and East wollega Zone. The Accesions that were tested were shown in the table below [15].

Table1: Ecological description of 10 Anchote Accession used for the Experiment (in Jimma and East Wollega)

Accession No	Region	Zone	District	Altitude
90801	Oromia	Horro Gudru Wollega	Abay Choman	1400
90802	Oromia	Horro Gudru Wollega	Abay Choman	1400
223087	Oromia	West Wollega		1400
223096	Oromia	East Wollega	Gutu Wayu	1909
223098	Oromia	East Wollega	Gutu Wayu	1909
223101	Oromia	East Wollega	Jimma Arjo	2470
223109	Oromia	Ilu Ababor	Ale	1940
229702	Amhara	East Gojjam	Hulet Iju Enese	2400
240407	SNNPR	Keficho Sheckicho	Decha	1820
Kuwe	Oromia	East Wollega	Sibu Sire	1987

SNNPR: Southern Nation Nationality and people Region

Source: (Daba)

Tillage and Planting

Tillage is to the mechanical manipulation of the soil with tools and implements so as to create favorable soil conditions for better seed germination and subsequent growth of crops

(Chandrasekaran) the frequency of tillage depends on the type of soil, climate and size of planting material. The frequency of tillage for Anchote is not recommended so far but experiment conducted on Anchote indicates that the land should be pulverized and fine seed bed should be prepared (Girma and Dereje; Meseret) [16].

Seeds are usually used for planting. Coccina is planted by farmers traditionally by broadcasting and mixing with soil (Mekbib and Deressa) however in experimental plots row planting is practiced for instance experiment conducted in JUCVAM and East wollega , the spacing they used is 10 cm between plants and 40 cm between row (Daba). Similarly , Girma and Hailu reported that an increase in intra row spacing from 10 to 30 cm results in reduct)on of root yield by 137 %

similar to intra – row spacing , increasing row spacing from 40 to 100 cm results a decrease in yield reduction of 37 %.

Table2: Effect of intra and row spacing on root yield of Anchote at Bako during 2002 to 2004

Intra row spacing (cm)	RY (t ha-1)	Inter row spacing (cm)	RY (t ha-1)
10	29.06	40	22.05
20	16.94	60	20.63
30	12.27	80	18.96
		100	16.05
CV	13.04		13.14
LSD	3.05		3.53

RY – Root Yeild

Source: (Girma and Hailu)

Fertilization

There is no much research done in nutrient management on Anchote but it was reported that Anchote requires highly fertile soil for efficient growth of nutrients (Meseret). It was reported that Farm yard Manure and Blended fertilizer (NPSB) affected days to physiological maturity, Vine number, Vine length, Marketable root yield and other parameters. The highest total root yield was recorded at 175 kg ha-1 NPSB and 10 t ha-1 FYM (Biratu), However, Girma and Hailu reported that the maximum root yield was recorded at 8 t ha-1 of FYM and the yield began to decline when the rate of FYM increased to 10 t ha-1 . Regarding the use of inorganic fertilizers, the maximum yield was recorded at Nitrogen rate of 46 kg ha-1 while Phosphorus rate of 20 kg ha-1 produced maximum yield. This indicated that the recommendation of fertilizers rate varies from area to an area [17].

Crop protection

The pests that attack Anchote crop are include bacterial leaf bight, powdery mildews and insect such as beetles which feed on the fruits and induce premature drop and decay of fruits. It will be attacked by rodent's monkeys, porcupines, rodents, wild pigs and others (Negash). There is no available agronomic data regarding pest management of crop

Harvesting

Farmers usually sow Anchote seed on April and Harvest it on July or August which is the duration of harvesting is 4 to 5 month. It was reported that the date of harvest and in situ storage affects the yield of tuber, Girma and Dereje reported that extending harvesting date from 4th months to 7 th month increased fresh and dry tuber by average of 450% and this trend is also observed in Sugar beet [18].

CONCLUSION AND RECOMMENDATION

Root and Tuber crops have significant contribution in enhancing food security in Ethiopia. Anchote is one of root and tuber crop which is popular in western and southern western part of the county. It is nutritious crop and has medicinal importance for diseases like gonorrhea, tuberculosis and cancer. The crop is used as security crops in case of crop failure in western part of the country. Although it is economically important crop, the attention given for crop low. There is less agronomic information due to less research conducted particularly except on spacing and fertilizer rate recommendation in Bako. Therefore research should be conducted in agronomy of Ancote which focuses on

- Agronomic recommendation on newly released variety
- Frequency of Tillage and Sowing depth
- Ancote production using different cropping system
- Recommendation of organic and inorganic fertilizer rate on different Anchote producing areas
- Crop protection ,like Weed control , Disease and Insect pest control

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