Cross Current International Journal of Economics, Management and Media Studies
Abbreviated Key Title: Cross Current Int J Econ Manag Media Stud
ISSN: 2663-2462 (Print) & Open Access
DOI: 10.36344/ccijemms.2024.v06i01.002

Volume-6 | Issue-1 | Jan-Feb, 2024 |

Original Research Article

Cost-benefit Analysis and Financial Feasibility of Rosemary Production in Southern Ethiopia

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| **Received:** 25.12.2023 | **Accepted:** 31.01.2024 | **Published:** 03.02.2024 |

Abstract: This study was conducted at Wondo Genet Agricultural Research Center experimental field from January 2018 to March 2021. The study examined the financial feasibility of WG-Rosemary-III rosemary variety for fresh herbs and WG-Rosemary-II rosemary variety for dry herb production. For this study, both rosemary varieties were planted on 100m2 land areas with an intra and inter-row spacing of 60cm. All cost and benefit data were collected during the cultivation period. The study utilized financial analysis methods such as net present value (NPV) and benefit-cost ratio (BCR) to analyze the feasibility of their production. The study found that the net present value of production of WG-rosemary-III for fresh herbs was ETB 2,603,219.63 per hectare in its entire three years of production, indicating that its production is financially feasible. The benefit-cost ratio of production of WG-rosemary-III for fresh herbs was 7.94 which indicates that a 1 ETB outlay for this rosemary production results in a net return of ETB 6.94 per hectare. Besides, the net present value of production of WG-rosemary-II for dry herb was ETB 1,186,051.02 per hectare in its entire three-year course of production, which indicates that its production is financially feasible. The benefit-cost ratio of production of WG-rosemary-II for dry herbs was 4.22 which indicates that a 1 ETB outlay for this rosemary production results to gain a net return of ETB 3.22. The results indicate that the production of these rosemary varieties is profitable. Therefore, the government and other concerned stakeholders should further scale up the production of these rosemary technologies through training and awareness creation for farmers and investors through extension agents, thereby these rosemary technologies are utilized as a significant source of income and contribute to the enhancement of household well-being.

Keywords: Benefit-cost ratio, Feasibility, Net present value, Net return, Wondo Genet.

1. INTRODUCTION

Rosemary (*Rosmarinus Officinalis*) is a perennial aromatic plant of the Lamiaceae family. It's an evergreen shrub with an intense pleasant smell reminiscent of pine wood. Rosemary is cultivated mainly in Mediterranean countries (Porte *et al*., 2000; Flamini *et al*., 2002). Rosemary is used as food flavorings, in culinary, cosmetics, and medicinal products due to the presence of valuable bioactive phytochemicals, flavors, and pigments (Ali *et al*., 2020; Celiktas *et al*., 2007, Jemia *et al*., 2013; Ribeiro *et al*., 2016). It has been traditionally used as a carminative, antispasmodic, painkiller, and circulatory tonic, to stimulate hair growth and improve memory dysfunction (Kuhn and Winston, 2000; Okoh *et al*., 2011). Rosemary is accompanied by several biologically active molecules that lead to producing pharmacological effects, such as anti-inflammatory (Altinier *et al*., 2007), antitumor (liver, breast, prostate, lung, and leukemia cancer cells (Visanji *et al*., 2006), antimicrobial and antioxidant (Karadag *et al*., 2019), anti-proliferation, and protective, inhibitory and attenuating activities (De Oliveira *et al*., 2017). Due to its high content of essential oils rosemary has been suggested to increase blood circulation, improve digestion, enhance memory, and activate the immune system (Begum *et al*., 2013). The fresh and dried herb is widely used as flavoring in many different food products on account of its powerful aromatic odor. The fresh and dried leaves of rosemary can be used as a spice or to make herbal tea for the curing of gastrointestinal disorders, pain, and inflammation-related diseases (Ahmed and Babakir-Mina, 2020). Fresh and dried rosemary leaves are used as seasonings for soups, stews, sausages, meat, fish, and poultry (Tigist *et al*., 2016).

Rosemary is grown in different agroecologies of Ethiopia and used for different purposes such as fresh leaf, dry leaf, and essential oil production. It is grown by the community and investors in several parts of the country (Beemnet *et al*., 2013; Dejene *et al*., 2016).

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Citation: Melkamu Tilaye & Guta Bukero (2024). Cost-benefit Analysis and Financial Feasibility of Rosemary Production in Southern Ethiopia. *Cross Current Int J Econ Manag Media Stud*, *6*(1), 10-17.

Although rosemary has been produced in different parts of Ethiopia; there is no information on the financial feasibility of the production of rosemary for the domestic market. As a result, our knowledge of the costs, benefits, and financial feasibility of rosemary production in Ethiopia is limited. This lack of information is an obstacle to exploiting rosemary production potential in the country. Thus, this study is therefore to examine the costs, benefits, and financial feasibility of rosemary production at Wondo Genet.

Objectives of the Study

- **To examine the financial feasibility of rosemary production**
- **To provide information on costs and returns of rosemary cultivation**

2. METHODOLOGY

2.1. Description of the Study Area

The study was conducted at Wondo Genet Agricultural Research Center, Sidama Regional State of Ethiopia, and was undertaken at Wondo Genet Agricultural Research Center experimental field for three years (January 2018 to March 2021). The geographical location of the study area ranges from 38º 37'13"-38º 38'20" East and 7º 5'23"-7º 5'52" North with an altitude range of 1760-1920 m.a.s.l.

2.2. Methods of Data Collection and Analysis

The planting materials used for this study were cuttings of rosemary varieties namely WG-rosemary-II and WG-rosemary-III. The cuttings of these rosemary varieties were planted and grown at the nursery site and then transplanted to the experimental field to a 100m^2 area of land for each variety with inter and intra-raw spacing of both varieties was 60 centimeters. To study the costs of production of rosemary varieties: the amount of labor in terms of man-days for pot filling for seedlings, cutting and planting of seedlings on the pots, watering of seedlings at nursery, land preparation of experimental field, planting, watering, weeding, and hoeing and harvesting operations were recorded accordingly by preparing data collection sheets. The total labor cost was calculated by using the average wage rate of Wondo Genet's surrounding wage rates. In addition to this, the cost of polythene tubes for seedlings, and the cost of plowing were recorded. Then the total cost of production was obtained by adding all these recorded costs. Revenues of rosemary production were estimated using the quantity produced of dry and fresh herbs of rosemary and the average market price of dry and fresh herbs of rosemary. Finally, all recorded data were converted to a per-hectare basis for analysis. To examine the feasibility of production of WG-rosemary-II for dry herbs and WG-rosemary-III for fresh herbs; financial analysis methods analyzing feasibility was followed. Thus, for this study, the two discounted measures: net present value (NPV) and benefit-cost ratio (BCR) methods were employed for analyzing financial feasibility.

Using the following formulas: the Total Revenue (TR), Net Present Value (NPV), and Benefit Cost Ratio (BCR) were calculated:

Total Revenue (TR)

$$TR=Q*P \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad \mathbf{1}$$

Where:

TR: Total Revenue

Q: Total quantity of fresh herbs and dry herbs of rosemary in kg

P: Selling price per kg of fresh herbs and dry herbs of rosemary

$$\mathbf{NR}=TR-TC \ldots\ldots\ldots\ldots\ldots\ldots \quad \mathbf{2}$$

Where:

NR: Net return (profit)

TC: Total cost of rosemary production for fresh herbs and dry herbs

TR: total revenue of rosemary production for fresh herbs and dry herbs

Net Present Value (NPV)

Net present value is the difference between the present worth of the benefit stream less the present worth of the cost stream. Or it is simply the present worth of the cash flow stream.

NPV = Present worth of benefit stream - present worth of cost stream = PV (benefits)-PV (costs) mathematically, it can be shown as:

$$NPV = \sum_{t=0}^{n} \frac{(Bn-Cn)}{(1+r)^n} \ldots\ldots\ldots\ldots\ldots\ldots\ldots 3$$

Where:

NPV: Net Present Value

Bn: Benefits in each year

Cn: Costs in each year

n: number of years

r: discount rate

Using NPV values, the decision is, if **NPV** values are positive, indicates that production of rosemary varieties viz. WG-Rosemary-II and WG-Rosemary-III for dry herb and fresh herb production are feasible if **NPV values** are negative indicating that the production of rosemary varieties is not feasible (Campbell and Brown, 2003).

Benefit Cost Ratio (BCR)

It is the ratio of the present worth of the benefit stream to the present worth of the cost streams, that is:

BCR = Sum of the present worth of benefit/sum of the present worth of costs

Mathematically, it can be shown as:

$$BCR= \frac{\sum_{t=0}^{n} \frac{Bn}{(1+r)^n}}{\sum_{t=0}^{n} \frac{Cn}{(1+r)^n}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad \mathbf{4}$$

Where:

BCR= Benefit-cost ratio
Bn = Benefit in each year
Cn = Cost in each year
n = number of years
r = discount rate.

Using **BCR**, the production of WG-rosemary-II for dry herbs and WG-rosemary-III for fresh herbs is feasible if the **BCR** of each rosemary variety is greater than 1. If it is less than one, it indicates that the production of rosemary varieties is not feasible (Campbell and Brown, 2003).

3. RESULTS AND DISCUSSION

This section presents the results and discussion of the analysis of the data of the study. It presents the results of yield, costs, returns, and financial feasibility analysis of the cultivation of WG-rosemary-II and WG-rosemary-III rosemary varieties.

3.1. Yield of Rosemary Production

As presented in Table 1, the average fresh herb yield per harvest of WG-rosemary-III rosemary variety in its entire course of cultivation was 15,670 kilograms per hectare. The maximum fresh herb yield per harvest was 25,140 kilograms per hectare and harvested in the third year of WG-rosemary-III rosemary variety cultivation and the minimum fresh herb yield per harvest was 8,400 kilogram per hectare and harvested in the first year of WG-rosemary-III rosemary variety cultivation. The average fresh herb yield per harvest in the third year was 17,456.67 kilogram per hectare which is greater than the average fresh herb yield per harvest for the first and second year of its cultivation which was 8,400 kilogram per hectare and, 16,625 kilograms per hectare respectively. This implies that even though there were fluctuations in yields, the trend on average fresh herb yields per harvest of WG-rosemary-III variety cultivation per each harvesting year did not diminish in the third year of its cultivation. Thus, this indicates this rosemary variety has the potential to produce adequate fresh herbs in its fourth year of cultivation.

Table 1: Fresh herb yield of WG-rosemary-III per harvest

Years of cultivation	Harvesting frequencies	Fresh herb yield (kg/ha)
1	1st	8,400
2	2nd	18,830
	3rd	14,420
3	4th	25,140
	5th	11,330
	6th	15,900
Average fresh herb per harvest(kg/ha)		15,670
Total fresh herb (kg/ha)		94,020

Source: field data, 2018-2021

As shown in Table 2, the average dry herb yield per harvest of WG-rosemary-II rosemary variety in its entire course of cultivation was 2,483.38 kilograms per hectare. The maximum dry herb yield per harvest was 3,633.12 kilogram per hectare and harvested in the second year of WG-rosemary-II rosemary variety cultivation and the minimum dry herb yield per harvest was 2,040.81 kilogram per hectare and harvested in the first year of WG-rosemary-II rosemary variety cultivation. The trend of dry herb production of WG-rosemary-II rosemary variety in years regarding average yield per harvest shows that, the average dry herb yield per harvest in the second year was 2,912.90 kilogram per hectare which is greater than the average dry herb yield per harvest for the first and third year of its cultivation which was 2,040.81 kilogram per hectare and, 2,344.56 kilograms per hectare respectively. The result reveals that the average dry herb yield of the WG-rosemary-II variety increased up to the second year of its cultivation and then it declined in the third year of its cultivation.

Table 2: Dry herb yield of WG-rosemary-III per harvest

Years of cultivation	Harvesting frequencies	Dry herb per yield (kg/ha)
1	1	2,040.81
2	2	3,633.12
	3	2,192.69
3	4	2,572.37
	5	2,346.93
	6	2,114.38
Average dry herb per harvest(kg/ha)		2,483.38
Total dry herb (kg/ha)		14,900.30

Source: field data, 2018-2021

3.2. Costs and Returns of Rosemary Cultivation

To calculate the costs of production of rosemary varieties the study used: the average wage rate of Wondo Genet surrounding wage rates which were birr 140 per man days and it was used to calculate costs of daily labor, cost of polyethylene tube (roll) was birr 105.59 per kilogram at the time of establishment of nursery seedlings. In addition to this, the cost of cuttings of

rosemary for seedling preparation, the costs of plowing and disking as well as other input costs of rosemary production were used in the calculation of the total cost of cultivation of rosemary varieties.

As shown in Table 3, the annual total cost of the first year of production of rosemary including transportation cost to the nearest market as well as cost of loading and unloading of WG-rosemary-III rosemary variety for fresh herb was ETB 251,630.01 per hectare which accounts for 57.43% of the entire production and, transportation, as well as loading and unloading costs over three years. The annual total cost of the second year's production, transportation, and loading and unloading cost was ETB 85,110.12 per hectare which accounts for 19.43% of the entire production, transportation, and loading and unloading costs over three years. The annual total cost of the third year's cultivation was ETB 101,381.24 per hectare which accounts for 23.14% of the entire production, transportation, and loading and unloading costs over three years. This shows that the cost of cultivation or production of the WG-rosemary-III rosemary variety was maximum in the first year and decreased in the second and third years of cultivation. This is because there were high initial costs in the first year such as the cost of plowing and disking, nursery costs, cost of planting material, cost of land preparation at the field, and cost of planting. In the three-year life of WG-rosemary-III rosemary variety production, the maximum cost was the cost of weeding and hoeing which was birr 81,286.80 per hectare which accounts for 18.55 % of the entire production and transportation costs over three years and the minimum cost was the cost of Tractor rent for plowing and disking which was birr 3,000 per hectare which accounts 0.68 % of the overall three years production and transportation costs.

The total revenue of WG-rosemary-III rosemary variety production in the first year was ETB 336,000 per hectare which accounts for 8.93% of the overall total revenue of three years of production. In the second year, total revenue was ETB 1,330,000.00 per hectare which is 35.36% of the entire cost of cultivation over three years. In the third year, total revenue was birr 2,094,800 per hectare this accounts for 55.7% of the overall total revenue of three years this rosemary production.

The production of WG-rosemary-III rosemary variety for fresh herb production provided a net return of ETB 84,370 per hectare in the first year, ETB 1,244,889.88 per hectare in its second year, and ETB 1,993,418.76 per hectare in the third year of its production. In addition to this, the overall net return obtained from cultivation of WG-rosemary-III rosemary for fresh herbs was 3,322,678.64 per hectare indicating that investing in the production of WG-rosemary-III rosemary variety fresh herb is profitable and its profit is attractive.

Table 3: Costs and returns of WG-rosemary-III for fresh herb production

Particulars	**Economic life in years**			**Total**
	1	**2**	**3**	
A. Fixed costs				
Tractor rent of plowing and disking (ETB/ha)	3,000			3,000
Annual land rent (ETB/ha)	8,000	8,000	8,000	24,000
B. **Nursery costs in ETB/ha (calculated using amounts of seedlings required for 1 hectare)**				
Costs of cuttings of rosemary	55,556			55,556
Costs polyethylene tube for seedling	6,567.70			6,567.70
Labor cost of traveling soil for pots and pot filling and arranging	20,720			20,720
Labor cost of cutting and planting of seedlings on pots	10,500			10,500
Labor cost watering of seedlings	21,000			21,000
C. Costs after transplanting				
Costs of land preparation (plowing and leveling) (birr/ha)	5,833.80			5,833.80
Cost of planting and furrow making (ETB/ha)	20,854.40			20,854.40
Labor cost of watering(birr/ha)	10,295.60	7,729.40	3,354.40	21,379.40
Weeding and hoeing (ETB/ha)	41,241.20	22,254.40	17,791.20	81,286.80
Harvesting (ETB/ha)	8,400	14,700	26,775	49,875
Total transport cost of transporting fresh herb rosemary to nearest market	6,000	18,000	27,000	51,000
Total loading and unloading cost of transporting fresh herb rosemary to the nearest market	840	3,325	5,237	9,402
Miscellaneous costs (15%)	32,821.31	11,101.32	13,223.64	57,146.27
Total cost (ETB/ha)	251,630.01	85,110.12	101,381.24	438,121.37
Fresh herb yield (kg/ha)	8,400	33,250	52,370	94,020
Total revenue (price 40 ETB/kg)	336,000.00	1,330,000.00	2,094,800.00	3,760,800.00
Net return of production (ETB/ha)	84,370.00	1,244,889.88	1,993,418.76	3,322,678.64

NB: Rosemary (fresh herb market price = 40 ETB/kg) [*Exchange rate= 1USD=54 ETB*] Source: field data, 2018-2021

As shown in Table 4, the annual total first year's production, transportation, and loading and unloading costs of WG-rosemary-II variety for dry herb was ETB 262,102.92 per hectare which accounts for 61.38 % of the entire production, transportation, and loading and unloading costs over three years. The annual total second year's production, transportation, and loading and unloading costs were ETB 77,618.54 per hectare which accounts for 18.18% of the entire production, transportation, and loading and unloading costs over three years. The annual total third year's production, transportation, and loading and unloading costs were ETB 87,329.81 per hectare which accounts for 20.45% of the entire production, transportation, and loading and unloading costs over three years. This shows that the cost of production of the WG-rosemary-II rosemary variety was maximum in the first year and decreased in the second and third years of production. This is because of the existence of high initial costs in the first year such as the cost of plowing and disking cost of planting material nursery costs, land preparation at the field, and cost of planting seedlings into the field. In the three-year life of WG-rosemary-II rosemary variety production, the maximum cost was the cost of weeding and hoeing which was ETB 78,866.20 per hectare which accounts for 18.47 % of the entire production, transportation as well as loading and unloading costs over the course of three years and the minimum cost was the cost of Tractor rent for plowing and disking which was ETB 3,000 per hectare which accounts 0.70% of the overall three years production, transportation as well as loading and unloading costs of this rosemary variety.

The total revenue of WG-rosemary-II rosemary production in the first year was ETB 265,305.30 per hectare which accounts for 13.7% of the entire total revenue of three years of production. In the second year, total revenue was ETB 757,355.30 per hectare which is 39.1% of 914,378.40 the overall total revenue of three years of production. In the third year, total revenue was birr 703,368 per hectare this accounts for 47.2% of the overall total revenue of three years of production.

The cultivation of WG-rosemary-II rosemary for dry herb production provided a net return of ETB 3,202.38 per hectare in the first year, ETB 679,736.76 per hectare in its second year, and ETB 827,048.59 per hectare in the third year of its production. In addition to this, the overall net return obtained from cultivation of WG-rosemary-II rosemary variety is ETB 1,509,987.73 per hectare indicating that investing in the production of WG-rosemary-II rosemary for dry herb has a positive net return, or in other words it is profitable and the profit is desirable.

Table 4: Costs and returns of WG-rosemary-II for dry herb production

Particulars	**Economic life in years**			**Total**
	1	**2**	**3**	
A. Fixed cost				
Tractor rent of plowing and disking	3,000			3,000
Annual land rent per hectare	8,000	8,000	8,000	24,000
B. Nursery costs in birr/ha (calculated using amounts of seedlings required for 1 hectare)				
Costs of cuttings of rosemary	55,556			55,556
Costs polyethylene tube for seedling	6,567.70			6,567.70
Labor cost of traveling soil for pots and pot filling and arranging	20,720			20,720
Labor cost of cutting and planting of seedlings on pots	10,500			10,500
Labor cost watering of seedlings	21,000			21,000
C. Costs after transplanting				
Costs of land preparation (plowing and leveling) (ETB/ha)	7,233.80			7,233.80
Cost of planting and furrow making (ETB/ha)	23,7720			23,772
Labor cost of watering (ETB/ha)	14,729.40	8,908.20	5,979.40	29,617
Weeding and hoeing (ETB/ha)	41,241.20	21,233.80	16,391.20	78,866.20
Harvesting (ETB/ha)	8,779.40	15,458.80	27,416.20	51,654.40
Cost of leaf separation from its stem (ETB/ha)	3,612	10,311	12,448.80	26,371.80
Total transport cost to the nearest market	3,000	3,000	5,000	11,000
Total loading and unloading cost	204.08	582.58	703.37	1,490.03
Miscellaneous costs (15%)	34,187.34	10,124.16	11,390.85	55,702.34
Total costs (ETB/ha)	262,102.92	77,618.54	87,329.81	427,051.27
Dry herb yield (kg/ha)	2,040.81	5,825.81	7,033.68	14,900.30
Total revenue (price 130 ETB/kg)	265,305.30	757,355.30	914,378.40	1,937,039
Net return of production (ETB/ha)	3,202.38	679,736.76	827,048.59	1,509,987.73

NB: Rosemary (dry herb market price of rosemary = 130 ETB/kg).
Source: field data, 2018-2021

3.3. Financial Feasibility of Rosemary Production

The financial feasibility of rosemary production was investigated by using investment analysis criteria. Among the criteria, the net present value (NPV) and benefit-cost ratio (BCR) were utilized to analyze the feasibility of the rosemary varieties for their dry and fresh herb production. The average market interest rate of 10% was used to calculate the discount factor.

As shown in Table 5, the net present value (NPV) of WG-rosemary-III rosemary variety for fresh herbs production was ETB 2,603,219.63 per hectare which is positive. Thus, this indicates that investing in WG-rosemary-III rosemary variety for fresh herb production is financially feasible. Similarly, the benefit-cost ratio (BCR) of WG-rosemary-III rosemary variety for fresh herb production was 7.94 which is greater than 1; indicating that a 1 ETB investment in WG-rosemary-III rosemary variety production gives a net benefit of ETB 6.94. The findings of the study revealed that in both feasibility measures investing in WG-rosemary-III rosemary variety for fresh herb production is financially feasible. This finding is in line with the findings of Hassen and Muluken (2014); Tamirat *et al*., (2014); Guta and Muluken, (2018) and Melkamu *et al.*, (2018) reported that the production of peppermint (*Mentha piperita L.), Hibiscus sabdariffa L.*, Lemon Verbena (Lominat) and lemongrass (*Cymbopogon citratus*) were financially feasible respectively.

Table 5: Financial feasibility analysis of WG-rosemary-III for fresh herb production

Particulars	Economic life in years			Total
	1	2	3	
Total revenue (ETB/ha)	336,000	1,330,000	2,094,800	3,760,8000
Total cost (ETB/ha)	251,630.01	85,110.12	101,381.24	438,121.37
Discounted total revenue (ETB/ha)	305,454.55	1,099,173.55	1,573,854.24	2,978,482.34
Discounted total costs (ETB/ha)	228,754.55	70,338.94	76,169.23	375,262.72
	NPV			2,603,219.63
	BCR			7.94

Source: field data, 2018-2021

As shown in Table 6, the net present value (NPV) of the production WG-rosemary-II rosemary variety for dry herb was ETB 1,186,051.02 per hectare which is a positive number. Thus, this indicates that investing in WG-rosemary-II rosemary variety for dry herb production is financially feasible. Similarly, the benefit-cost ratio (BCR) of WG-rosemary-II rosemary variety for dry herb production was 4.22 which is greater than 1; indicating that a 1 ETB outlay in WG-rosemary-II rosemary variety production gives a net benefit of ETB 3.22 in return. The results revealed that in both financial feasibility measures investing in WG-rosemary-II rosemary variety for dry herb production is financially feasible. This result is in agreement with the findings of Hassen and Muluken (2014); Tamirat *et al*., (2014); Guta and Muluken, (2018), Melkamu *et al*., (2018), Guta (2019) reported that the production of peppermint (*Mentha piperita L.), Hibiscus sabdariffa L.*, Lemon Verbena (Lominat), lemongrass (*Cymbopogon citratus*) and Palmarosa grass (*Cymbopogon martini*) were financially feasible respectively.

Table 6: Financial feasibility analysis of WG-rosemary-II for dry herb production

Particulars	Economic life in years			Total
	1	2	3	
Total revenue (ETB/ha)	265,305.30	757,355.30	914,378.40	1,937,039
Total costs (ETB/ha)	262,102.92	77,618.54	87,329.81	427,051.27
Discounted total revenue (ETB/ha)	241,186.64	625,913.47	686,986.03	1,554,086.13
Discounted total costs (ETB/ha)	238,275.38	64,147.55	65,612.18	368,035.11
	NPV			1,186,051.02
	BCR			4.22

Source: field data, 2018-2021

As presented in Table 5, both production of WG-rosemary-III rosemary variety for fresh herbs and WG-rosemary-II rosemary variety for dry herbs are profitable. However, the production of WG-rosemary-III rosemary variety for fresh herbs is more profitable than WG-rosemary-II rosemary variety for its dry herb production.

CONCLUSION AND RECOMMENDATION

This study aimed to analyze the costs, benefits, and financial feasibility of WG-rosemary-III rosemary variety for fresh herbs and WG-rosemary-II rosemary variety for dry herb production at Wondo Genet, Sidama Regional State of Ethiopia. The study has been conducted at Wondo Genet Agricultural Research Center for three years. The findings of the study revealed that for both rosemary varieties, the larger share of the costs

of production was attributed to the labor cost of watering plants whereas the lowest share of the costs of production was attributed to the rental value of Tractor for plowing and disking of farmland. Besides, the production of the WG-rosemary-III variety for fresh herbs and the WG-rosemary-II variety for dry herbs are financially feasible or in other words, their production is profitable. Therefore, the production of WG-rosemary-III for fresh herbs and WG-rosemary-II for dry herbs is an important alternative to generating additional income as well as diversifying sources of income for producers in rural areas. Since the production of rosemary varieties was found to have a positive net return and was financially feasible as well as the profit was too attractive. The government and other concerned stakeholders should further scale up the production of these rosemary technologies through awareness creation and training for farmers, and investors by extension agents and other concerned government officials, thereby these rosemary technologies are used as a crucial source of income and contribute to the improvement of well-being of households.

ACKNOWLEDGMENT

We would like to acknowledge the Aromatic and Medicinal Research Program for its financial support. Next, our deepest gratitude goes to our field assistant Sofonias Admasu for his contribution in data recording during the time of rosemary production.

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