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# Influence of Environment and harvesting cycle on Growth, yield and yield components of Lavender (*Lavandula anguistifolia* L.)

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**The trial was carried out at three locations such as at Hawassa, Wondo Genet and Koka from 2014 to 2015 to determine appropriate environment and harvesting cycle for the growth, yield and yield components of Lavender *(Lavandula angustifolia* L.). The experiment comprised three levels of harvesting cycle (Cycle 1, 2 and 3) were used on a plot size of 3.6 m length and 3.6 m width arranged in Randomized Complete Block Design (RCBD) with four replications. SAS (version 9) software was used to compute the analysis of variance. The LSD test was used to compare the mean separations at 5 % probability level. The result revealed that, most of the studied parameters were influenced significantly by the main effects (location and harvesting cycle) and interaction effect. The highest percent essential oil content and essential oil yield/ha were obtained at Koka from the second harvesting cycle and Hawassa from the first harvesting cycle, respectively. In contrast, the respective least value was obtained at Wondo Genet from the second harvesting cycle and at Koka from the third harvesting cycle. Therefore, cultivation of Lavender at Hawassa and a place where having the same agro-ecologies to Hawassa from the tasted harvesting cycle is highly recommended for the production of the highest essential oil yield.**

**Keywords:** *Lavandula angustifolia* L., Location, Harvesting cycle, Percent essential oil content, Essential oil yield

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## INTRODUCTION

Lavender (*Lavandula angustifolia* L.) is a perennial shrub which belongs to the mint family Lamiaceae. It is native to southern Europe and the Mediterranean area and is commercially cultivated in France, Spain, Portugal, Hungary, the UK, Bulgaria, Australia, China and the USA (Shawl and kumar, 2000). This plant is cultivated primarily for its aromatic inflorescence from which the essential oil is isolated, although its fresh and dried flowers are also marketed (Renaud *et al.*, 2001).

Lavender's essential oil is commonly used in aromatherapy and massage. Its major clinical benefits are on the central nervous system (Chu and Kemper, 2001). The essential oil is also known for its excellent aroma and is extensively used in the perfumery, flavour and cosmetic industries. The oil is known to possess sedative, carminative, anti-depressive and anti-inflammatory properties (Cavanagh, 2005). Chu and Kemper (2001) also stated that, Lavender extracts have traditionally been prescribed to treat infertility, infection, anxiety and fever, and have been used as antidepressants, antispasmodics, anti flatulent agents, antiemetic remedies and diuretics. Its essential oil has gained a strong reputation in aromatherapy and as a holistic relaxant to treat stress, anxiety, depression, fatigue or insomnia (Chu and Kemper, 2001). Studies suggest that lavender aroma during recesses prevents deterioration of work performance (Sakamoto *et al*., 2005) and might improve memory and cognition in Alzheimer's patients (Adsersen *et al.,* 2005).

Even if it has enormous benefits, there is a limited finding regarding to the horticultural management of laveder worldwide including Ethiopia. This would resulted cultivation of the crop without knowing it's appropriate management practices. This leads to reduction of the production and productivity of lavender. Though, research is useful to minimize the reduction of growth, yield and yield components of lavender. Therefore, the main objective of this study was to determine appropriate environment and harvesting cycle on growth, yield and yield components of lavender.

## MATERIAL AND METHODS

The lavender genotype which was used for this experiment was introduced from France in 2014 and tested at different locations of Ethiopia to evaluate its growth and yield response for different harvesting cycles from 2014 to 2015. This experiment consisted of three locations (Wondo Genet, Hawassa and Koka) and three harvesting cycles (Cycle 1, 2 and 3). The descriptions of tested locations were presented at table 1. The experiment was lied out in Randomized Complete Block Design (RCBD) with four replications. SAS (version 9) software computer program was used to compute the analysis of variance. The LSD test was used to compare the mean separations at 5 % probability level. A spacing of 60 cm between plants and between rows and 1 m between replications were maintained. Six plants/row and six rows were maintained per plot.

Top shoot cuttings with 15 cm length were taken from an actively growing and disease free mother plants which were maintained at Wondo Genet Agricultural Research Center for seedling preparation. The bottom two thirds of the leaves were stripped from each cutting and plant the cuttings on the polyethylene tube which was filled with proportion of 1:2:1 sand, forest soil and farm yard manure, respectively. Seedlings were raised at nursery for two months before being transplanted to the main field experimental plots. Harvesting was done when it was flowered. The whole above ground biomass was cut at 15 cm from the ground level by using sickles. Data on plant height, number of days to 50% flower bud development, number of flowering branches/plant, fresh flower and leaf weight/plant, fresh above ground biomass/plant, fresh leaf and flower to stem ratio, fresh leaf and flower yield/ha, percent essential oil content of the leaves and the flowers, and essential oil yield/ha were collected and recorded properly.

## RESULT AND DISCUSSION

### Plant height (cm)

The analysis of variance table revealed that, main effect location had a very highly significant ($p<0.001$) influence on plant height (Table 2). This result is in line with the finding of Beemnet *et al.* (2012; 2014b; 2014c) and Kassahun *et al.* (2015). The highest plant height was obtained at Hawassa; whereas, the least value was obtained at Wondo Genet (Table 3). Plant height was increased by 45.47% and 14.97% at Hawassa as compared to Wondo Genet and Koka, respectively. This could be due to the favorable environmental condition of Hawassa for vertical growth of the plant as compared to Wondo Genet.

Likewise, harvesting cycle had a very highly significant ($p<0.001$) influence on plant height (Table 2). The highest plant height was obtained at the first harvesting cycle; whereas, comparatively the least value was obtained at the third harvesting cycle (Table 4**)**. As harvesting cycle increased from first to third, plant height was decline by 7.1% and 26.47% at the second and third harvesting cycle, respectively.

Similarly, the combined effect had a very highly significant ($p<0.001$) influence on plant height (Table 2). The highest plant height was obtained at Wondo Genet from the first harvesting cycle followed by at Hawassa from the third harvesting cycle; whereas, the least value was obtained at Wondo Genet from the third harvesting cycle (Table 5).

### Days to 50% flower bud initiation

The analysis of variance table revealed that, main effect location had a very highly significant ($p<0.001$) influence on days to 50% flower bud initiation (Table 2). The highest days to 50% flower bud initiation was obtained at Wondo Genet; whereas, the least value was obtained at Hawassa (Table 3). Days to 50% flower bud initiation delayed by 44.67 days at Wondo Genet as compared to

**Table 1.** Summary of site descriptions of tested locations in Ethiopia

| Location | Latitude | Longitude | Soil pH | Soil type | Mean Annual Rainfall (mm) | Altitude (m.a.s.l) | Annual average temperature (°C) | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Minimum | Maximum |
| **Hawassa** | 7°05'N | 39°29'E | 7.2 | Sandy loam (Andosol) | 964 | 1700 | 12.94 | 27.34 |
| **Wondo Genet** | 7°19'N | 38°38'E | 6.4 | Sandy clay loam (Nitosol) | 1128 | 1780 | 11 | 26 |
| **Koka** | 8°26' N | 39°1' E | 8.2 | Clay soil | 830.9 | 1604 | 13.68 | 28.30 |

**Table 2**. Analysis of variance for growth and yield of Lavender (*Lavandula angustifolia* L.)

| SOV | DF | PH | D50%FBI | NFBP | LFWP | AGBP | LFSR | LFYH | EOC | EOYH |
|---|---|---|---|---|---|---|---|---|---|---|
| **Replication** | 3 | 14.45 | 4.33 | 137.73 | 3752.49 | 3394.86 | 0.6 | 115817.48 | 0.09 | 82.32 |
| **Location (Loc.)** | 2 | 4120.63*** | 5985.36*** | 1665.6*** | 302488.57*** | 497902.45*** | 27.49*** | 95862.04*** | 0.66*** | 3121.01*** |
| **Cycle** | 2 | 1152.27*** | 5552.78*** | 4098.6*** | 436.97ns | 40135.99ns | 2.28* | 13486.15ns | 1.89*** | 613*** |
| **Loc.*Cycle** | 4 | 2694.44*** | 12482.19*** | 2769.7*** | 3105.93ns | 126422.21*** | 4.22*** | 9336065.99ns | 0.87*** | 243.14** |
| **Error** | 24 | 95.67 | 5.35 | 169.1 | 6712.8 | 11855.95 | 0.57 | 207185 | 0.03 | 49.03 |
| **CV (%)** | **-** | **15.4** | **1.09** | **15.21** | **24.65** | **25.79** | **20.49** | **24.65** | **12.04** | **25.44** |

Where, SOV= Source of variance, DF= Degree of freedom, PH= Plant height (cm), D50% FBI= Days to 50% flower bud initiation, NFBP= Number of flowering branches/plant, LFWP= Fresh leaf and flower weight (g/plant), AGBP= Fresh above ground biomass (g/plant), LFSR= Fresh leaf and flower to stem ratio, LFYH= Fresh leaf and flower yield (kg/ha), EOC= Essential oil content (%), EOYH= Essential oil yield (kg/ha), CV= Coefficient of variation, *,** ns= Statistical not significant at 0.05 probability level and ***= Significant at 0.05, 0.01 and 0.001 probability level, respectively.

**Table 3.** Effects of growing environment on growth and yield performance of Lavender *(Lavandula angustifolia* L.*)* during 2014/15

| Location | PH (cm) | D50%FBI | NFBP | LFWP (g) | AGBP (g) | LFSR | LFYH (kg) | EOC (%) | EOYH (kg) |
|---|---|---|---|---|---|---|---|---|---|
| **Hawassa** | 79.58[a] | 189.08[c] | 84.63[b] | 470.06[a] | 538.72[a] | 3.27[b] | 2611.5[a] | 1.71[a] | 44.13[a] |
| **Koka** | 67.67[b] | 211.33[b] | 97.67[a] | 158.73[c] | 186.98[b] | 5.37[a] | 881.8[c] | 1.35[b] | 11.92[c] |
| **Wondo Genet** | 43.23[c] | 233.75[a] | 74.15[b] | 368.48[b] | 540.85[a] | 2.43[c] | 2047.1[b] | 1.27[b] | 26.51[b] |
| **LSD $_{0.05}$** | 8.24 | 1.95 | 10.96 | 69.03 | 91.75 | 0.64 | 383.52 | 0.15 | 5.9 |
| **CV (%)** | 15.4 | 1.09 | 15.21 | 24.65 | 25.79 | 20.49 | 24.65 | 12.04 | 25.44 |

Means followed by the same letter with in the same column are not statistically significant a probability level of 0.05.

Hawassa.

Likewise, harvesting cycle had a very highly significant (p<0.001) influence on day to 50% flower bud initiation (Table 2). The highest day to 50% flower bud initiation was obtained at the first harvesting cycle; whereas, the least value was obtained at the third harvesting cycle (Table 4). As harvesting cycle increased from one to three, day to 50% flower bud initiation decreased by 17.34%. This indicated us, as harvesting cycle increase from one to three, day to 50% flower bud initiation of lavender will become shorter. Similarly, the combined effect had a very highly significant (p<0.001) influence on day to 50% flower bud initiation (Table 2). The highest day to 50% flower bud initiation was obtained at Koka from the first harvesting; whereas, the least value was obtained at Hawassa from the third

**Table 4.** Effects of harvesting cycle on growth and yield performance of Lavender *(Lavandula angustifolia* L.*)* during 2014/15

| Cycle | PH (cm) | D50%FBI | NFBP | LFWP (g) | AGBP (g) | LFSR | LFYH (kg) | EOC (%) | EOYH (kg) |
|---|---|---|---|---|---|---|---|---|---|
| **Cycle-1** | 71.50[a] | 225.83[a] | 104.68[a] | 333.89 | 355.94 | 3.34[b] | 1854.9 | 1.73[a] | 34.22[a] |
| **Cycle-2** | 66.42[b] | 221.67[b] | 67.82[c] | 337.59 | 447.96 | 3.55[ab] | 1875.5 | 1.61[a] | 28.34[a] |
| **Cycle-3** | 52.57[b] | 186.67[c] | 83.95[b] | 325.79 | 462.65 | 4.18[a] | 1810 | 0.99[b] | 19.99[b] |
| **LSD $_{0.05}$** | 8.24 | 1.95 | 10.96 | ns | ns | 0.64 | ns | 0.15 | 5.9 |
| **CV (%)** | 15.4 | 1.09 | 15.21 | 24.65 | 25.79 | 20.49 | 24.65 | 12.04 | 25.44 |

Where, ns= Statistical not significant at 0.05 probability level. Means followed by the same letter with in the same column are not statistically significant a probability level of 0.05.

**Table 5.** Interaction effects on the growth and yield performance of Lavender *(Lavandula angustifolia* L.*)* during 2014/15

| Interaction | PH (cm) | D50%FBI | NFBP | LFWP (g) | AGBP (g) | LFSR | LFYH (kg) | EOC (%) | EOYH (kg) |
|---|---|---|---|---|---|---|---|---|---|
| **WG*Cy1** | 94.75[a] | 190.25[f] | 103.15[b] | 395.11 | 613.66[ab] | 1.82[d] | 2195.1 | 1.93[a] | 42.44[a] |
| **WG*Cy2** | 84.45[ab] | 245[c] | 61.7[c] | 358.99 | 556.45[bc] | 1.87[d] | 1994.4 | 1.22[c] | 24.51[b] |
| **WG*Cy3** | 23.80[e] | 266[b] | 57.6[cd] | 351.34 | 452.44[c] | 3.62[c] | 1951.9 | 0.65[d] | 12.58[cd] |
| **Koka*Cy1** | 49.75[d] | 284[a] | 88.7[b] | 170.92 | 199.17[d] | 6.15[a] | 949.6 | 1.26[c] | 11.73[cd] |
| **Koka*Cy2** | 38.30[d] | 205[e] | 101.5[b] | 156.49 | 184.74[d] | 5.16[ab] | 869.4 | 2.05[a] | 17.86[bc] |
| **Koka*Cy3** | 41.65[d] | 145[h] | 102.8[b] | 148.78 | 177.03[d] | 4.81[b] | 826.6 | 0.75[d] | 6.17[d] |
| **Haw*Cy1** | 70[c] | 203.25[e] | 122.2[a] | 435.64 | 255[d] | 2.06[d] | 2420.2 | 1.99[a] | 48.49[a] |
| **Haw*Cy2** | 76.5[bc] | 215[d] | 40.25[d] | 497.29 | 602.68[abc] | 3.617[c] | 2762.7 | 1.56[b] | 42.66[a] |
| **Haw*Cy3** | 92.25[a] | 149[g] | 91.45[b] | 477.26 | 758.47[a] | 4.12[bc] | 2651.4 | 1.58[b] | 41.24[a] |
| **Overall mean** | 63.50 | 211.39 | 85.48 | 422.18 | 3.69 | 1.44 | 27.52 | 63.50 | 211.39 |
| **LSD $_{0.05}$** | 14.28 | 3.38 | 18.98 | ns | 158.91 | 1.1 | ns | 0.25 | 10.22 |
| **CV (%)** | 15.4 | 1.09 | 15.21 | 24.65 | 25.79 | 20.49 | 24.65 | 12.04 | 25.44 |

Where, WG= Wondo Genet, Haw= Hawassa, Cy= Cycle and ns= Statistical not significant at 0.05 probability level. Means followed by the same letter with in the same column are not statistically significant a probability level of 0.05.

harvesting cycle (Table 5).

**Number of flowering branches/plant**

Location had a very highly significant (p<0.001) influence on number of flowering branches/plant (Table 2). The highest number of flowering branches/plant was obtained at Koka; whereas, comparatively the least value was obtained at Wondo Genet (Table 3). This result is in line with the findings of Beemnet *et al.* (2012) and Kassahun *et al.* (2015).

Likewise, harvesting cycle had a very highly significant (p<0.001) influence on number of flowering branches/plant (Table 2). The highest number of flowering branches/plant was obtained at the first harvesting cycle; whereas, the least value was obtained at the second harvesting cycle (Table 4). As harvesting cycle increased from first to third, number of flowering branches/plant was increased by 35.21% and 19.8% at first harvesting cycle as compared to second and third harvesting cycle, respectively.

Similarly, the combined effect had a very highly significant (p<0.001) influence on number of flowering branches/plant (Table 2). The highest number of flowering branches/plant was obtained at Hawassa from the first harvesting cycle; whereas, the least value was obtained at Wondo Genet from the second harvesting cycle (Table 5).

**Fresh leaf and flower weight per plant (g)**

Location had a very highly significant (p<0.001) influence on fresh leaf and flower weight/plant (Table 2). The highest fresh leaf and flower weight/plant was obtained at Hawassa; whereas, comparatively the least value was obtained at Koka (Table 3). Fresh leaf and flower weight/plant was increased by 66.23% and 21.61% at Hawassa as compared to Koka and Wondo Genet, respectively. However, fresh leaf and flower weight/plant did not significantly ($p>0.05$) influenced by the main effect harvesting cycle and interaction of location and harvesting cycle (Table 2).

**Fresh above ground biomass per plant (g)**

Location had a very highly significant ($p<0.001$) influence on fresh above ground biomass/plant (Table 2). Supported result was reported by Beemnet *et al.* (2015) on sage. The highest fresh above ground biomass/plant was obtained at Wondo Genet followed by Hawassa; whereas, comparatively the least value was obtained at Koka (Table 3). Fresh above ground biomass/plant was decline by 65.42% and 65.29% at Koka as compared to Wondo Genet and Hawassa, respectively. However, fresh above ground biomass/plant did not significantly ($p>0.05$) influenced by harvesting cycle (Table 2).

The combined effect had a very highly significant ($p<0.001$) influence on fresh above ground biomass/plant (Table 2). The highest fresh above ground biomass/plant was obtained at Hawassa from the third harvesting cycle; whereas, the least value was obtained at Koka from the third harvesting cycle (Table 5).

**Fresh leaf and flower to stem ratio**

Location had a very highly significant ($p<0.001$) influence on fresh leaf and flower to stem ratio (Table 2). The highest fresh leaf and flower to stem ratio was obtained at Koka; whereas, comparatively the least value was obtained at Wondo Genet (Table 3). This could be due to the highest proportion of fresh leaf and flower weight/plant to fresh stem weight/plant at Koka as compared to Hawassa and Wondo Genet.

Fresh leaf and flower to stem ratio was significantly ($p<0.05$) influenced by harvesting cycle (Table 2). The highest fresh leaf and flower to stem ratio was obtained at the third harvesting cycle; whereas, the least value was obtained at the first harvesting cycle (Table 4). This implies that, an increase in harvesting cycle will increase fresh leaf and flower weight/plant and a decline in fresh stem weight/plant of Spanish mint.

Similarly, the combined effect had a very highly significant ($p<0.001$) influence on fresh leaf and flower to stem ratio (Table 2). The highest fresh leaf and flower to stem ratio was obtained at Koka from the first harvesting cycle; whereas, the least value was obtained at Wondo Genet from the first harvesting cycle (Table 5).

**Fresh leaf and flower yield per hectare (kg)**

Location had a very highly significant ($p<0.001$) influence on fresh leaf and flower yield/ha (Table 2). The highest number of fresh leaf and flower yield/ha was obtained at Hawassa; whereas, comparatively the least value was obtained at Koka (Table 3). As to fresh leaf and flower weight/plant, fresh leaf and flower yield/ha was increased by 66.23% and 21.61% at Hawassa as compared to Koka and Wondo Genet, respectively. As fresh leaf and flower weight/plant increased, it contributed for an increase in fresh leaf and flower yield/ha. This might be due to the direct relationship of the two parameters if the spacing between plants is identical. However, fresh leaf and flower yield/ha did not significantly ($p>0.05$) influenced by the main effect harvesting cycle and interaction of location and harvesting cycle (Table 2).

**Essential oil content (%)**

Location had a very highly significant ($p<0.001$) influence on percent essential oil content (Table 2). Supporting resulted was reported by Beemnet *et al.* (2012) on Rose Scented Geranium, Beemnet *et al.* (2014a) on Spearmint, Beemnet *et al.* (2014b) on Lemongrass, Beemnet *et al.* (2014c) on Oregano, Beemnet *et al.* (2015) on Chamomile and Kassahun *et al*. (2015) on Sage. The highest percent essential oil content was obtained at Hawassa; whereas, comparatively the least value was obtained at Wondo Genet (Table 3). Percent essential oil content was increased by 21.05% and 25.73% at Hawassa as compared to Koka and Wondo Genet, respectively.

Harvesting cycle had a very highly significant ($p<0.001$) influence on percent essential oil content (Table 2). The highest percent essential oil content was obtained at the first harvesting cycle; whereas, comparatively the least value was obtained at the third harvesting cycle (Table 4). As harvesting cycle increased from one to three, the percent essential oil content was decreased by 42.77%.

Similarly, the combined effect had a very highly significant ($p<0.001$) influence on percent essential oil content (Table 2). The highest percent essential oil content was obtained at Koka from the second harvesting cycle; whereas, the least value was obtained at Wondo Genet from the second harvesting cycle (Table 5).

**Essential oil yield per hectare (kg)**

Location had a very highly significant ($p<0.001$) influence on essential oil yield/ha (Table 2). Supporting resulted was reported by Beemnet *et al.* (2012) on Rose Scented Geranium, Beemnet *et al.* (2014a) on Spearmint, Beemnet *et al.* (2014b) on Lemongrass, Beemnet *et al.* (2014c) on Oregano, Beemnet *et al.* (2015) on Chamomile and Kassahun *et al*. (2015) on Sage. The highest essential oil yield/ha was obtained at Hawassa; whereas, comparatively the least value was obtained at Koka (Table 3). Essential oil yield/ha was increased by 72.99% and 39.93% at Hawassa as compared to Koka and Wondo Genet, respectively. This is due to an increase in fresh leaf and flower yield/ha contributed for an increase in essential oil yield/ha.

Harvesting cycle had a very highly significant (p<0.001) influence on essential oil yield/ha (Table 2). The highest essential oil yield/ha was obtained at the first harvesting cycle; whereas, comparatively the least value was obtained at the third harvesting cycle (Table 4). As harvesting cycle increased from one to three, the essential oil yield/ha was decreased by 41.58%. This indicated that, essential oil yield declined when harvesting cycle increased. This could be due to a decline in fresh leaf and flower yield/ha.

Similarly, the combined effect had a very highly significant (p<0.001) influence on essential oil yield/ha (Table 2). Comparatively the highest essential oil yield/ha was obtained at Hawassa from the first harvesting cycle; whereas, the least value was obtained at Koka from the third harvesting cycle (Table 5). This could be due to the favorable environmental condition of Hawassa for production of essential oil yield/ha as compared to Koka and Wondo Genet.

## CONCLUSSION

This study demonstrated that, experimental location had a significant influence on plant height, days to 50% flower bud initiation, number of flowering branches/plant, fresh leaf and flower weight/plant, above ground biomass/plant, fresh leaf and flower to stem ratio, fresh leaf and flower yield/ha, percent essential oil content and essential oil yield/ha. The highest plant height, fresh leaf and flower weight/plant, fresh leaf and flower yield/ha, percent essential oil content and essential oil yield/ha were obtained at Hawassa; number of flowering branches/plant and fresh leaf and flower to stem ratio were obtained at Koka; days to 50% flower bud initiation and above ground biomass/plant were recorded at Wondo Genet. In contrast, the least plant height and percent essential oil content were obtained at Wondo Genet; fresh leaf and flower yield/ha and essential oil yield/ha were obtained at Koka; days to 50% flower bud initiation at Hawassa. The main effect harvesting cycle had a significant influence on plant height, days to 50% flower bud initiation, number of flowering branches/plant, fresh leaf and flower weight/plant, fresh leaf and flower to stem ratio, percent essential oil content and essential oil yield/ha; however, harvesting cycle did not significantly influenced fresh leaf and flower weight/plant, above ground biomass/plant and fresh leaf and flower yield/ha. The highest plant height, days to 50% flower bud initiation, number of flowering branches/plant, percent essential oil content and essential oil yield/ha were obtained at the first harvesting cycle; fresh leaf and flower to stem ratio was recorded at the third harvesting cycle. Whereas, the least plant height, days to 50% flower bud initiation, percent essential oil content and essential oil yield/ha were obtained at the third harvesting cycle; fresh leaf and flower to stem ratio and number of flowering branches/plant at the first and second harvesting cycle, respectively. Moreover, interaction effect had a significant influence on all parameters except fresh leaf and flower weight/plant, and fresh leaf and flower yield/ha. The highest percent essential oil content and essential oil yield/ha was obtained at Koka from the second harvesting cycle and at Hawassa from the first harvesting cycle, respectively. In contrast, the least values were obtained at Wondo Genet from the third harvesting cycle and at Koka from the third harvesting cycle, respectively. Therefore, cultivation of Lavender at Hawassa and a place where having the same agro-ecologies to Hawassa from the tasted harvesting cycle is highly recommended for the production of the highest essential oil yield.

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