

**Supplementary material Methods S1.** Fertilization treatments applied in the pilot cultivation of *Origanum dictamnus* with other Cretan endemic plants [26-29] at the premises of the Hellenic Mediterranean University.

**Scheme A.** Integrated nutrient management (INM) by foliar application (INM-fa): The nutrient solution consisted of THEORUN at 7 ml L<sup>-1</sup>, THEOCAL at 1.5 g L<sup>-1</sup>, THEOFAST at 5 ml L<sup>-1</sup>, 10-47-10 (AGRI.FE.M. LTD Fertilizers, Greece) at 3.2 g L<sup>-1</sup>, K<sub>2</sub>SO<sub>4</sub> (0-0-52, AGRI.FE.M. LTD Fertilizers, Greece) at 2.07 g L<sup>-1</sup>, micronutrients (Plex Mix, AGRI.FE.M. LTD Fertilizers, Greece) at 1.5 ml L<sup>-1</sup> and MgSO<sub>4</sub> (Mg 25.6%, AGRI.FE.M. LTD Fertilizers, Greece) at 0.6 g L<sup>-1</sup>.

**Scheme B.** Conventional inorganic fertilization by foliar application (ChF-fa): The nutrient solution consisted of NH<sub>4</sub>NO<sub>3</sub> (34,4-0-0, Neofert®, Neochim PLC, Bulgaria) at 2.7 g L<sup>-1</sup>, Ca(NO<sub>3</sub>)<sub>2</sub> (NITROCAL, Agrohimiki, Greece) at 1.7 g L<sup>-1</sup>, 10-47-10 at 3.2 g L<sup>-1</sup>, K<sub>2</sub>SO<sub>4</sub> (0-0-52) at 2.27 g L<sup>-1</sup>, micronutrients Plex Mix at 1.5 ml L<sup>-1</sup> and MgSO<sub>4</sub> (Mg 25.6 %) at 0.6 g L<sup>-1</sup>.

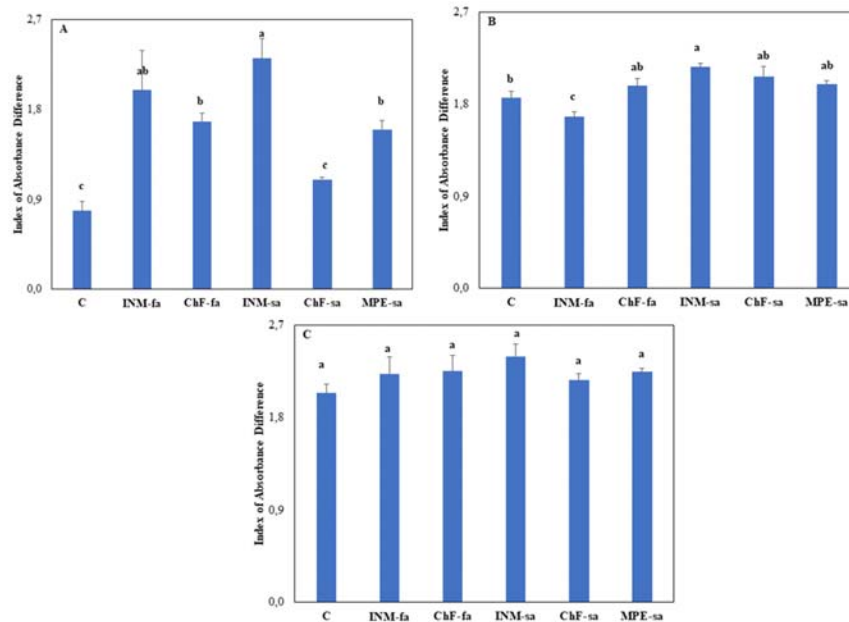
**Scheme C.** Control, with foliar and soil applications with tap water.

**Scheme D.** INM by soil application (INM-sa): The nutrient solution consisted of THEORUN at 7 ml L<sup>-1</sup>, THEOCAL at 1.5 g L<sup>-1</sup>, THEOMASS at 10 ml L<sup>-1</sup>, 10-47-10 at 3.2 g L<sup>-1</sup>, K<sub>2</sub>SO<sub>4</sub> (0-0-52) at 2.1 g L<sup>-1</sup>, micronutrients Plex Mix at 1.5 ml L<sup>-1</sup> and MgSO<sub>4</sub> (Mg 25.6 %) at 0.3 g L<sup>-1</sup>.

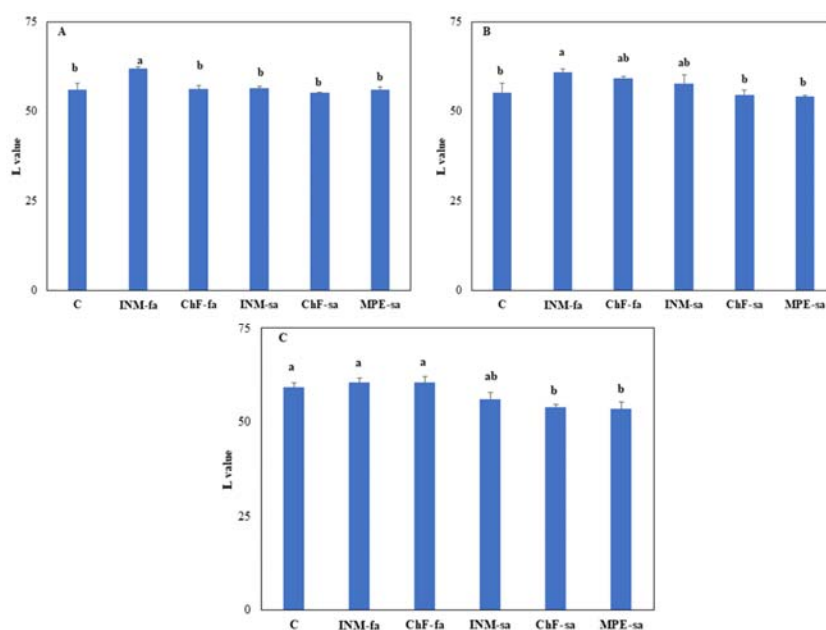
**Scheme E.** Conventional inorganic fertilization by soil application (ChF-sa): The nutrient solution was consisted of NH<sub>4</sub>NO<sub>3</sub> (34,4-0-0) at 2.7 g L<sup>-1</sup>, Ca(NO<sub>3</sub>)<sub>2</sub> (NITROCAL) at 1.7 g L<sup>-1</sup>, 10-47-10 at 3.2 g L<sup>-1</sup>, K<sub>2</sub>SO<sub>4</sub> (0-0-52) at 2.3 g L<sup>-1</sup>, micronutrients, Plex Mix at 1.5 ml L<sup>-1</sup> and MgSO<sub>4</sub> (Mg 25.6 %) at 0.3 g L<sup>-1</sup>.

**Scheme F.** Mixture of plant extracts as biostimulant by soil application (MPE-sa): The nutrient solution was consisted of THEOMASS at 10 ml L<sup>-1</sup>.

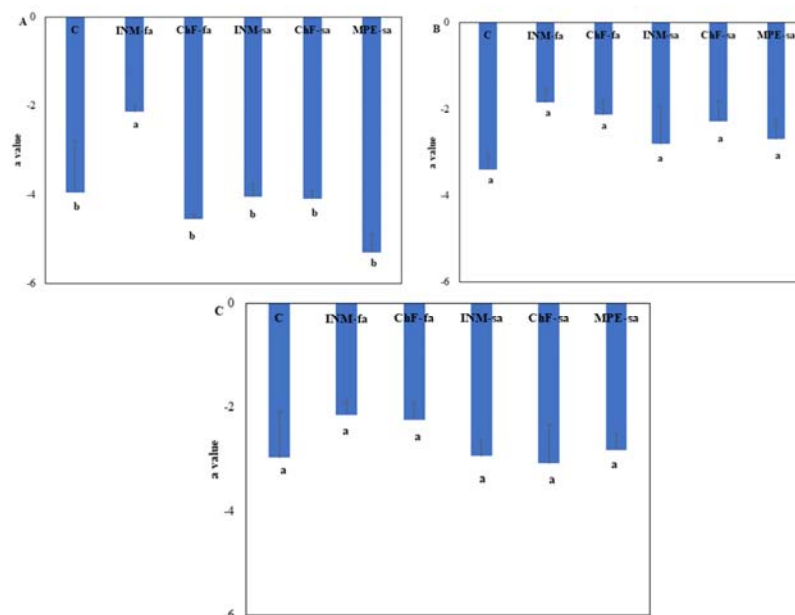
## Supplementary material Figures S1-S4



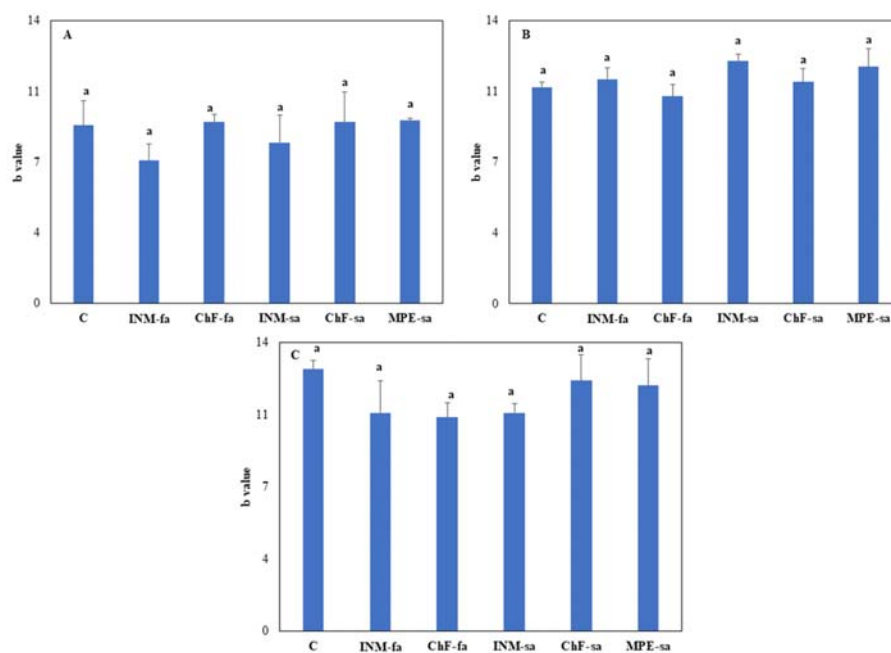
**Supplementary Figure S1.** Effect of fertilization scheme through different application methods (foliar/soil) on leaf index of absorbance difference of *Origanum dictamnus* at vegetative (A), early flowering (B), and full flowering (C) stage. C: Control (water); INM-fa: Integrated nutrient management (INM) by foliar application; ChF-fa: Conventional inorganic fertilization by foliar application; INM-sa: INM by soil application; ChF-sa: ChF by soil application; MPE-sa: biostimulant by soil application (THEOMASS). Columns represent the mean of three replicates  $\pm$  SEM. Within each plot, different letters indicate significant differences among means.



**Supplementary Figure S2.** Effect of fertilization scheme through different application methods (foliar/soil) on leaf L value of *Origanum dictamnus* at vegetative (A), early flowering (B), and full flowering (C) stage. C: Control (water); INM-fa: Integrated nutrient management (INM) by foliar application; ChF-fa: Conventional inorganic fertilization by foliar application; INM-sa: INM by soil application; ChF-sa: ChF by soil application; MPE-sa: biostimulant by soil application (THEOMASS). Columns represent the mean of three replicates  $\pm$  SEM. Within each plot, different letters indicate significant differences among means.



**Supplementary Figure S3.** Effect of fertilization scheme through different application methods (foliar/soil) on leaf  $a^*$  value of *Origanum dictamnus* at vegetative (A), early flowering (B), and full flowering (C) stage. C: Control (water); INM-fa: Integrated nutrient management (INM) by foliar application; ChF-fa: Conventional inorganic fertilization by foliar application; INM-sa: INM by soil application; ChF-sa: ChF by soil application; MPE-sa: biostimulant by soil application (THEOMASS). Columns represent the mean of three replicates  $\pm$  SEM. Within each plot, different letters indicate significant differences among means.



**Supplementary Figure S4.** Effect of fertilization scheme through different application methods (foliar/soil) on leaf b\* value of *Origanum dictamnus* at vegetative (A), early flowering (B), and full flowering (C) stage. C: Control (water); INM-fa: Integrated nutrient management (INM) by foliar application; ChF-fa: Conventional inorganic fertilization by foliar application; INM-sa: INM by soil application; ChF-sa: ChF by soil application; MPE-sa: biostimulant by soil application (THEOMASS). Columns represent the mean of three replicates  $\pm$  SEM. Within each plot, different letters indicate significant differences among means.