POSTER PRESANTATIONS

❖ SUSTAINABLE AGRICULTURE (INCLUDING LANDSCAPE PLANNING AND FORESTRY)

Oryzalin induced polyploids demonstrated superior morphology and enhanced levels of essential oil production in Melissa officinalis.

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Abstract
Melissa officinalis L. is a widely utilized aromatic herb belonging to the lamiaceae family. It is grown across the globe for its wide range of pharmacological uses. Traditionally, it has been used to treat various respiratory and gastrointestinal conditions. Consequently, researches has been done on the breeding of M. officinalis. using traditional methods, although none of the previous studies have explored the scope of synthetic polyploidization in M. officinalis. Hence, the aim of the current study was to obtain polyploids of M. officinalis using oryzalin via in vitro somatic polyploidization. Nodal segments were cultured under in vitro conditions on Murashige and Skoog (MS) for 48 hours prior to oryzalin treatment. Thereafter, nodal segments were treated with three oryzalin concentrations (20, 40, and 60 µM) for 24 and 48 hours. Flow cytometry and direct chromosome counting were then used to confirm the ploidy of the treated plant. Obtained polyploids were micro-propagated and transferred to be grown under field conditions. Thereafter, morphological, anatomical, and biochemical data were collected for further statistical analysis. Oryzalin treatment yielded a total of 8 polyploids across all treatments. The obtained morphological, anatomical, and biochemical data exhibited a significant difference between diploid and tetraploid plants. For instance, the leaf area, and thickness increased by almost 50 percent, and a higher trichome density was achieved in tetraploid plants compared to the mother diploid plant. Additionally, larger stomata size and higher chlorophyll content indicate a higher photosynthetic capacity in polyploids. The results obtained provide valuable insights into the breeding possibilities in M. officinalis and related species.