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## Study of some factors affecting callus growth and silymarin content of *Silybum marianum* L.

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Amino acids, precursor type and concentration, and light conditions were examined for their effects on milk thistle (*Silybum marianum* L.) callus growth and silymarin biosynthesis. Proline level at 10 mg/l seems to be the most suitable treatment for callus fresh weight under light and dark incubations. Also, proline at 10 mg/l added to MS medium resulted in the highest value of callus dry weight under light conditions, followed by caffeic acid at 50 mg/l. Precursor feeding with 10 mg/l phenylalanine recorded the highest accumulation of silymarin under dark and light conditions compared to other precursors (tyrosine and caffeic acid). Generally, in most treatments, light incubation slightly inhibited silymarin biosynthesis but recorded a stimulation effect on callus growth.

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## The status of the agricultural income earned by to the smallholder producer of Lejweleputswa district, free state province, South Africa

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The main objective is to determine the factors that affect smallholder agriculture producer's income on Lejweleputswa district Free State province of South Africa. A probability sampling method that involves simple random technique was used to select the desired sample of 120 smallholder respondents. Data were collected using sets of pre-tested questionnaire through face to face interview, telephone interview and self administered questionnaire. A Gross margin was used to assess the status of the agricultural income earned by the smallholder producers. The studies have discovered that most of the smallholder producers were earning lower income where at some instances it was at the negative. Since the 1950s government and donors have spent large amounts money on agricultural credit programmes supporting farmers. To date, it is more than a decade since DAFF (Department of Agriculture Forestry and Fisheries) initiated the national agricultural support programme. In 2016, the African Union (AU) together with the New Partnership for Africa Development (NEPAD) created an agricultural initiative called the Comprehensive Africa Agricultural Development Programme (CAADP) with the goal of pursuing economic growth through agriculture-led development. One of the aims of the CAADP is to reduce poverty and hunger on the continent and achieve the Millennium Development Goal (MDG). This aim has lead to the birth of CASP in 2004 by the South African Government to eradicate hunger and extreme poverty. The provincial Department are the custodians to implement the programme not just as to make the production infrastructure available but as the strategy to meet the MDG goal to 'eradicate extreme poverty and hunger' and indirectly supporting goal to 'promote gender equality and empowerment of women' by encouraging women to penetrate in food production as it is currently male dominated and 'reduce child mortality' by increasing food production and access to healthy food by all.

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