**ABSTRACT**

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| Title of Thesis | : | Effect of crowding on CO2 emission and cocoon productivity in silkworm |
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**ABSTRACT**

One of the most important factors determining the larval and cocoon characters of silkworm, *Bombyx mori*, is the provision ofspace to the worms during rearing, especially during the 5th instar, when the space requirement of the wormsis maximum. Limitation of space or crowding greatly affects the physiology of worms influencing the cocoon production besides leading to over production/emission of carbon dioxide which has a directbearing on growth of silkworm larvae. Keeping this in view,the present investigation entitled **“Effect of crowding on CO2 emission and cocoon productivity in silkworm”** was carried out to assess the impact of crowding and CO2 on commercial cocoon characters and silkworm health.Experiments were conducted on commercial bivoltine silkworm hybrid FC1 × FC2, comprising of seven treatments. Population densities of 300, 350, 400, 450, 500, 550 and 600 worms/6ft2 per tray were utilized to evaluate and recommend the optimum silkworm populationnumber required to be reared under specific unit area commercially.The results of experiment revealed that CO2 emission was minimum and maximum at densities of 300 and worms/6ft2, respectively. The duration of different instars as well as total larval duration (days) was found inversely proportional to increase in crowding and CO2 emission. The study also showed that the weight of larvae, percentage larval survival and pupation decreased with the increase in crowding and subsequent increase in CO2 emission. Cocoon parameters such as cocoon yield by weight, cocoon yield by number,Total filament length (m) and Non-breakable filament length (m) varied significantly with increase in crowding with minimum and maximum values at 300 and 600 worms/6ft2, respectively.The result obtained from this study revealed a highly significant variance on the feed efficacy parameters like food consumption, utilization, digestibility, food consumption index rate and coefficient of food utilization. It was observed that the increase in crowding and CO2 emission,the consumption and digestion of food shows a gradual decline with maximum and minimum values of consumption (52.70±1.02g and43.20±0.1g) and digestion (89.43±1.03% &84.22±1.85%) of food at 300 and 600 worms/6ft2, respectively. It was concluded from this study that the larval population density ranging from 300 to 400 worms/6ft2/tray is economically and commercially optimum for good silkworm rearing.

**Keywords:** *Bombyx mori* L. rearing, crowding, CO2 emission, food dynamics, cocoon productivity.