1125-92-98 **Jean MS Lubuma*** (jean.lubuma@up.ac.za), Dept of Mathematics and Applied Mathematics, Faculty of Natural and Agricultural Sciences, University of Pretoria, Pretoria, Gauteng 0002, South Africa, **Mataeli B Lerata** (mataelilerata@gmail.com), Dept of Mathematics and Applied Mathematics, University of Pretoria, Pretoria, Gauteng 0002, South Africa, and **Abdullahi Yusuf** (aayusuf@zoology.up.ac.za), Dept of Zoology and Entomology, University of Pretoria, Pretoria, Gauteng 0002, South Africa. *Continuous and discrete models for the declines of honeybee colonies.*

The alarming declines of the population of managed honeybees, specifically the Colony Collapse Disorder (CCD), constitute a serious threat to agriculture. To Khoury, Myerscough and Barron (KMB) model [PlosOne, 6(4), e18491, (2011)], we add two models. The first one is a limit of the KMB model in that the recruitment rate is a constant representing either a positive lower bound or a negative upper bound of the recruitment rate. In the second model, motivated by the Capensis calamity in South Africa, we describe the parasitic scenario by a lower recruitment rate. We show, for the KMB model and its limit, that there exists a critical value of the foragers' death rate, which is a transcritical bifurcation. In particular, above this value, the trivial equilibrium point is globally asymptotically stable, i.e. there is CCD. When the recruitment rate is negative, the CCD arises irrespective of the death rate of foragers. Equally, for the social parasite model, we prove the unconditional occurrence of the CCD. The underlying nonlinearity in the three models is a Holling function of type 2. Inspired by our earlier work on the Michaelis-Menten equation, we construct nonstandard finite difference schemes that are dynamically consistent with the continuous models. (Received July 25, 2016)