We present some basic discrete models in populations dynamics of single species with several age classes. Starting with the basic Beverton-Holt model that describes the change of single species we discuss its basic properties such as a convergence of all solutions to the equilibrium, oscillation of solutions about the equilibrium solutions, Allee’s effect, Jillson’s effect, etc. We consider the effect of the constant and periodic immigration and emigration on the global properties of Beverton-Holt model. We also consider the effect of the periodic environment on the global properties of Beverton-Holt model.