The study investigated the effect of soil application of neem at different concentrations on lifetable parameters of Myzus persicae (Sulzer) (Hemiptera: Aphididae). After pepper seedlings were transplanted to pots of 1.5 L, the pepper plants had been divided into five different groups to be watered with only irrigation water (as control) and irrigation water containing 250, 500, 750, and 1000 mg L-1 of neem. Based on the results, intrinsic rate of increase (rm), net production rate (R0) and mean generation time (T0) ranged from 0.039 to 0.352 female/female/day, 1.700 to 57.295 female/female and 11.503 to 15.086 days respectively. Doubling time (T2) and finite rate of increment (?) ranged from 1.970 to 17.915 days and 1.039 to 1.422 individual/female/day, respectively. Consequently, the effect of neem on biological characters of the pest was increased in response to the increase in neem concentration applied systemically through plant root.