Glycine Betaine (GB) is an organic osmolyte that accumulates in a variety of plant species in response to environmental stresses such as drought, salinity, low and high temperatures. In many crop plants, the natural accumulation of GB is lower than sufficient to ameliorate the adverse effects of dehydration caused by various environmental stresses. There are many reports demonstrating the positive effects of exogenous application of GB on plant growth. These observations suggest that the application of GB may play a role in resistance to the low temperatures of Zoysiagrass (Zoysia japonica). The objective of this study was to examine whether exogenous GB and N (nitrogen) applications would prevent early dormancy and enhance spring green-up of Zoysiagrass. Within the scope of this study, the field experiment was carried out during 2018, at Akdeniz University, Antalya, Turkey, in order to investigate the effect of foliar application of GB on fall color retention and overall turfgrass performance of Zoysiagrass. The study will be repeated in 2019. For this purpose, three foliar GB (0, 3.12 g/L and 6.24 g/L) and three nitrogen rates (0, 2.5 and 5 g/m² N) were applied to Zoysiagrass, in September, October, and November. The trial was set up in a 3 x 3 factorial randomized complete block design with three replications. The data including quality, color, green cover, relative chlorophyll content, shoot number and leaf nutrient content were evaluated. Turfgrass color and quality were significantly increased under GB + N applications. The high GB + N application enhanced fall color retention. Application of GB as the foliar spray has also increased the contents of chlorophyll. Preliminary results indicated that exogenous GB application has the potential to enhance fall color retention and winter performance of Zoysiagrass.