Bermudagrass and zoysiagrass are two commonly used turfgrass on golf course fairways in the southern and transition zone of the United States. Due to its excellent turf performance and superior cold tolerance compared to bermudagrass, zoysiagrass are the dominant turfgrass used in upper transition zone area, including Missouri. However, bermudagrass still grow aggressively in the warm seasons which brings encroachment problem on many zoysiagrass fairways. Similar sensitivities of the two species to most commonly used post-emergence herbicides make it very difficult to remove one from the other. Research was focused on selectively control of common bermudagrass in zoysiagrass turf without unacceptable damage to desired turfgrass. Experiments were first conducted in the greenhouse to screen out the most promising herbicides from 15 original treatments. Selected chemicals were tested on a golf course where severe bermudagrass encroachment happened on the zoysiagrass fairway. Results show that aryloxyphenoxypropionate (AOPP) herbicides provided more than 90% control on bermudagrass with minimum impact on desired zoysiagrass. However, the greenhouse study also showed that the two tested bermudagrass varieties exhibited significant different sensitivities to the same AOPP herbicides treatments. Although the two bermudagrass varieties are in the same species, genetic variations still exist and most likely contribute to the differentiated responses. As a result, turf managers are recommended to consider the potential inconsistent control when managing different bermudagrass varieties with AOPP herbicides. Future studies focused on investigation of the mechanisms underline the intra-species differentiation among bermudagrass varieties are planned.