Mustard seed meal is derived from residues of seed from a specific mustard plant, after the seed has been crushed or pressed and the oils are extracted. Mustard seeds as well as other parts of the mustard plant contain compounds that in the presence of water will release chemicals that have been shown to suppress a number of different weed species and diseases. With the concern over the safety and environmental impact of soil fumigants such as methyl bromide mustard seed meal (MSM) is a potential alternative. In the turf industry, soil fumigants are used to eliminate diseases, insects, and weed species prior to establishing new turf areas on golf courses and sports turf. Currently, very little information is available in the literature regarding oriental mustard seed meal in turf. A better understanding of the efficacy of MSM for controlling weeds and as a preventative measure for dollar spot are needed. Research was conducted with the objective of comparing the effects of oriental mustard seed meal to dazomet, a synthetic compound used for soil fumigation, on the germination of different weeds and turfgrasses, by evaluating plant counts and biomass. Also, comparisons were conducted with MSM to a fungicide known as iprodione, to determine effectiveness for control of dollar spot. Dollar spot is one of the most common turfgrass diseases found around the U.S. Finally, the last objective was to determine the time interval after application of MSM and planting of turf seeds (plant-back intervals) for cool season turfgrasses such as tall fescue, Kentucky bluegrass, creeping bentgrass, and perennial ryegrass. This was determined following the use of MSM as a soil fumigant by evaluating plant counts weekly after application and plant biomass. Research indicates that the numbers of weed and turfgrass species tested were suppressed up to 90% as rates of MSM increased. However, some species such as bermudagrass were least sensitive to MSM. Plant biomass of all species was also reduced up to 99% as rates of MSM increased, although some species such as tall fescue and perennial ryegrass showed an increase in plant biomass as rates increased. Infected areas of the turf with the disease dollar spot were also reduced up to 74% as MSM increased; overall turfgrass color and quality increased over time. Higher rates of MSM also caused unacceptable turfgrass injury, but were only observed within two weeks of application. Many cool season turfgrasses were also reduced if planted the same day as MSM application. When turfgrasses were planted following 7 days after incorporation of MSM, tall fescue and perennial ryegrass showed an increase in plant counts as well as plant biomass, which may also indicate that MSM could possibly be beneficial due to a release in plant available nitrogen. The overall indication of this work is that seed meal from mustard plants can reduce the incidence of selected weeds and the disease dollar spot. More research is needed to determine the best practices to integrate MSM into an integrated management program for renovating turfgrass for golf courses and sports turf.