SEQUENCE AND IMPORTANCE OF EVENTS DURING GRASS ESTABLISHMENT[1]

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Abstract: Revegetation is needed after land disturbances for most land uses to protect the soil resource from excessive erosion and to restore productivity to the area. Grasses are often used for revegetation after land disturbances caused by mining, cropping, fire, or overgrazing. Grass seedlings become established through a series of events that are influenced by the environmental conditions and inherent grass species characteristics. These events (germination, emergence, and crown placement) and their importance will be discussed in this poster paper. Germination occurs when temperature and imbibed water is optimal for initiation of growth for the specific grass species. At this time the embryo swells and the radicle and coleoptile begin to extend outside the seed coat. The elongation of the grass seedling coleoptile and mesocotyl if developed, results in emergence. The potential elongation of the coleoptile and mesocotyl dictates the maximum depth of planting for a specific grass species. The location of the crown in relationship to the soil surface is important because most tillers and adventitious roots develop at this level in the soil. Grass plant crowns that are located close to the soil surface are exposed to fast soil drying, high temperatures, and other surface impacts such as fire and overgrazing. Crown placement results from the elongation of the mesocotyl and leaf internodes, when expressed, and is located on the developing seedling where two or more nodes remain close together. Successful establishment is often considered completed when the grass seedling is autotrophic and its secondary adventitious root system is developed enough to insure adequate water and nutrients for continued growth and development of the photosynthesizing seedling. Our understanding of the events of grass establishment enable us to select the best grass species or cultivars and cultural practices to enhance successful grass revegetation after land disturbances.

Additional Key Words: Sideoats grama, western wheatgrass, smooth bromegrass germination, emergene, crown placement, mesocotyl, coleoptile, leaf internode

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