**Sorghum Growth and Development**

### Vegetative

**Stage 1 – Three-Leaf**
Three leaves are fully expanded with a visible collar (leaf tip extends 20 to 25 days after emergence). The growing point is above the soil surface and changes from producing leaves to forming heads. Maximum plant growth and nutrient uptake rates are achieved. Following growth point differentiation, rapid stem elongation and leaf development occurs.

### Reproductive

**Stage 6 – Half-Bloom**
Half-bloom occurs at 70% of the plants in a field blooming. Total growth is 50% complete. Compared to final nutrient content at maturity, nutrient accumulation is 60% for phosphorus, 70% for nitrogen, and more than 80% for potassium.

### Management
Scout for insects, diseases, weeds, and other production issues. Minimizing weed competition from planting through this growth stage is critical.

**Stage 7 – Soft-Dough**
Grain reaches 75% of its final dry weight and nutrient uptake is almost complete. Lower leaves lose functionality due to remobilization of nutrients to grains or senescence. Final yield depends on the rate of dry-matter accumulation and duration, with longer duration usually translated in greater yields.

### Management
A severe stress at this growth stage can still reduce grain yield, but not to the extent possible in the soft-dough stage. Freeze can negatively impact yields if the crop does not reach maturity before this event occurs.

**Stage 8 – Hard-Dough**
Grain moisture content is 15% to 25% when hardness is achieved. Mature grain is identified by looking for the dark spot (the black layer) on the bottom of the kernel (blocking the movement of dry matter and nutrients to grains). Grain moisture ranges from 25% to 35%.

### Management
A severe stress at this growth stage can still reduce grain yield, but not to the extent possible in the soft-dough stage. Freeze can negatively impact yields if the crop does not reach maturity before this event occurs.

**Stage 9 – Physiological Maturity**
Grain reaches maximum dry weight and is physiologically mature. Mature grain is identified by looking for the dark spot, the black layer, on the bottom of the kernel (blocking the movement of dry matter and nutrients to grains). Grain moisture ranges from 15% to 25%.

### Management
Harvest time depends on the environmental conditions. Drying can be promoted using desiccants without affecting yield when applied after physiological maturity.