

Chapter 2: Sunflower Growth Stages



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Sunflower hybrids planted in South Dakota typically range in maturity from 80 to 100 days. Knowing current and historic weather information for a specific area of South Dakota may be important in hybrid selection. Current and historic weather data, including average growing degree-days and precipitation, is available from the SDSU Mesonet at climate.sdstate.edu.

Sunflowers require soil temperatures of 50°F to germinate. The sunflower plant will put its cotyledon leaves above ground within a few days of planting. The growing point is situated between the cotyledon leaves and gives rise to the first pair of true leaves.

Once the first true leaf reaches 1 ½ inches in length, the plant is in the V1 growth stage. V2 is when the second true leaf reaches 1 ½ inches in length (Fig. 2.1).



Figure 2.1. Sunflower plant showing two true leaves fully expanded at V2 growth stage (Photo: Ruth Beck, SDSU).

In general, the vegetative growth stages are determined by counting the number of true leaves that are present. The number of leaves a plant produces is variety dependent and can vary substantially. The vegetative growth stages will continue until the plant develops a bud at the top of the stem. The stage at which the terminal bud forms at the top of the stalk is referred to as R1 (Fig. 2.2).



Figure 2.2. R1 growth stage in sunflowers (Photo credits to Patrick Wagner.).

The R1 growth stage is the beginning of the reproductive growth stages. The terminal bud will continue to stretch and grow in size. The R2 and R3 growth stages are reached when the terminal bud elongates above the nearest leaf (Fig. 2.3). The R4 growth stage is reached when the flower begins to open

and immature ray petals can be viewed when looking down on the bud.



Figure 2.3. R3 growth stage in sunflowers (Photo: Ruth Beck, SDSU).

The R5 growth stage is marked by the opening of the yellow ray petals and is the beginning of the flowering stage. Flowering or R5 in sunflowers is divided into substages. The substages are named according to the percent of disc flowers that are flowering. Therefore R5.1 would tell us that 10% of the disk flowers are flowering and R5.5 would indicate that 50% of the disk flowers are opened (Fig. 2.4).



Figure 2.4. R5.5 growth stage. Approximately 50% of the disk flowers have opened (Photo: Ruth Beck, SDSU).

Once flowering is complete and the ray flowers begin to wilt the plant has reached R6. At R7 the back of the head starts to turn pale yellow (Fig. 2.5). The back of the head is yellow, but the bracts remain green at R8. The R9 growth stage is reached when the back of the heads and the bracts are yellow to brown. At R9 the plant is determined to be at physiological maturity.



Figure 2.5. Sunflower plant at R7 growth stage. The back of the head is turning yellow (Photo: Ruth Beck, SDSU).

Selected References

Berglund, D. R. 2007. Sunflower Production. NDSU Extension Service. A-1331.



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