

Cereal Staging Guide

Growing Forward 2 

A federal-provincial-territorial initiative

Alberta  Government

Canada 

Introduction

Accurate crop staging is essential to ensure crop safety and the optimal performance of crop protection products and agronomic supplements including In-Crop Urea Ammonium Nitrate (UAN), plant growth regulators (PGRs) and foliar fungicides.

Applications of crop protection products and agronomic supplements must be made based on growth stages (GS) described on product labels.

The following guide can be useful in determining cereal developmental stages. Photos illustrate critical BBCH (Biologische **B**undesanstalt **B**undessortenamt und **CH**emische Industrie) cereal stages from a field, individual plant, tiller separated and main stem view.

Growth stages overlap because each tiller can be at a different growth stage. Accurate staging is based on the main stem, which has the most advanced development. Staging is not based on an average of all tillers.

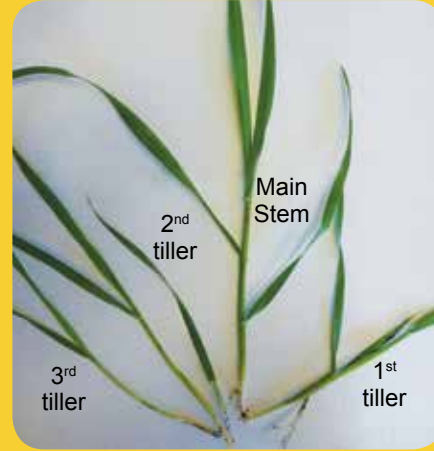
Growth Stage 33-34: Early stem elongation



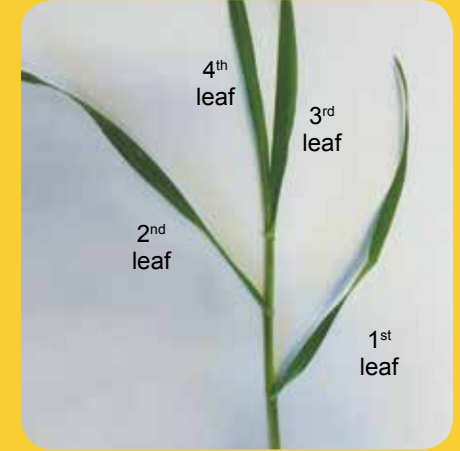
Field View GS 33-34. Individual rows are still visible; nearly at canopy closure.



Plant View GS 33-34. Tillers are visible, but with this view, it is challenging to determine number of leaves or amount of stem elongation.



Tillers Separated GS 33-34. Individual plants should be separated into their tillers. If it is challenging to determine if you are dealing with multiple plants or simply individual tillers, remember you will find one seed per plant. The main stem is the most developed and largest stem. It will be the focus of your staging activities.



Main Stem View GS 33-34. Discard tillers and focus staging efforts on main stem. In this photo, there are 4 leaves with the 4th leaf just unrolling. At **GS 33**, node 3 is at least 2 cm above node 2. At **GS 34**, node 4 is at least 2 cm above node 3. Nodes can be found by cutting the base of the stem lengthwise.

Growth Stage 37-39: Late stem elongation



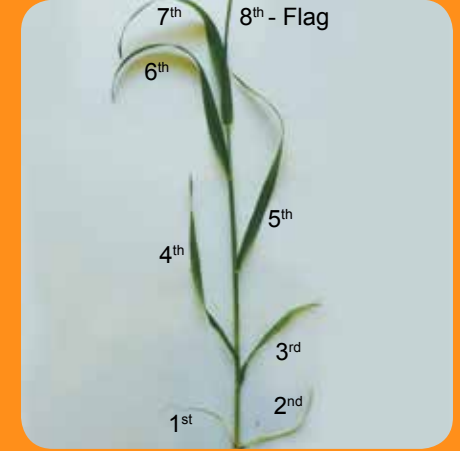
Field View GS 37-39. Canopy closure has been reached.



Plant View GS 37-39. Individual plants are 30-40 cm tall. Tillers are visible, but with this view, it is challenging to determine number of leaves or amount of stem elongation.



Tillers Separated GS 37-39. Individual plants should be separated into their tillers. If it is challenging to determine if you are dealing with multiple plants or simply individual tillers, remember you will find one seed per plant. The main stem is the most developed and largest stem. It will be the focus of your staging activities.



Main Stem View GS 37-39. Discard tillers and focus staging efforts on main stem. In this photo, there are 8 leaves with the 8th (flag) leaf just unrolling. The plant has reached **GS 39** once the flag leaf is fully unrolled and the ligule is just visible.



Growth Stage 47-49: End of booting

At **GS 47**, the plant is reaching the end of booting as indicated by the flag leaf sheath opening. At **GS 49**, booting is complete, the leaf sheath is splitting and the awns (in awned cultivars) have just emerged.



Growth Stage 55: Inflorescence emergence and heading

At **GS 55**, the head is 50% emerged on the main stem. This photo was taken 52 days after seeding.

Growth Happens Fast



Plants are at the 1 leaf stage (GS 11).
This photo was taken 10 days
after seeding.



Plants are at early stem elongation (GS 33-34). This photo was taken 33 days after seeding.



Plants are at late stem elongation (GS 39). This photo was taken 43 days after seeding.



Plants are at inflorescence emergence and heading (GS 55). This photo was taken 52 days after seeding.

Putting Growth Staging to Work



Wheat research plot demonstrating standard management and no foliar fungicide applications.



Wheat research plot demonstrating a foliar fungicide application at **GS 39**.



Wheat research plot demonstrating a foliar fungicide application at **GS 55**.



Wheat research plot demonstrating a dual foliar fungicide application at **GS 39** and **GS 55**.

Reference

Lancashire, P.D., H. Bleiholder, T. Van den Boom, P. Langelüddeke, R. Stauss, Elfriede Weber, and A. Witzemberger. 1991. A uniform decimal code for growth stages of crops and weeds. *Ann. appl. Biol.* 119:561-601.

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