Cereal growth stages (GS)

Germination
(GS00 to GS09)

GS07 Germinating seed with root (which forms first) and shoot

Seedling growth
(GS10 to GS19)

GS10 First leaf through coleoptile
GS11 First leaf unfolded (ligule visible)
GS13 Three leaves unfolded on the main shoot
GS15 Five leaves unfolded
GS19 Nine or more leaves unfolded on the main stem

A leaf is unfolded when its leaf collar, at the junction between blade and sheath, has emerged from the sheath of the preceding leaf.
**Tillering**
*(GS20 to GS29)*
- **GS20** Main shoot only
- **GS21** Main shoot and one tiller
- **GS23** Main shoot and three tillers
- **GS25** Main shoot and five tillers
- **GS29** Main shoot and nine or more tillers

**Stem elongation**
*(GS30 to GS39)*
- **GS30** Ear at 1cm (pseudostem erect)
- **GS31** First node detectable
- **GS32** Second node detectable
- **GS33** Third node detectable
- **GS37** Flag leaf just visible
- **GS39** Flag leaf blade all visible

Distance between base of the plant and the top of the shoot apex on the main stem is 1cm or more, but the length of the 1st internode is less than 1cm.

When stem elongation begins it is necessary to split the main shoot to determine the correct crop Growth Stage.

For a quick, but crude assessment, fold back the leaf sheaths then count the slight ‘bumps’ caused by each node.

The exact stage is revealed by stripping off leaves and cutting the main stem longitudinally with a sharp knife.
Cereal growth stages

**GROWTH STAGE 31**

1st node detectable

An internode is 1cm or more but the internode above is less than 2cm

Sometimes a node may be below the ground and may bear roots. Even if this occurs, as long as the internode below it exceeds 1cm it is still counted.

**GROWTH STAGE 32**

2nd node detectable

2nd and subsequent nodes counted when the internode below them exceeds 2cm.

**Booting**

( GS40 to GS49 )

GS41 Flag leaf sheath extending

GS43 Flag leaf sheath just visibly swollen

GS45 Flag leaf sheath swollen

GS47 Flag leaf sheath opening
Cereal growth stages

Ear emergence (GS50 to GS59)

GS51 First spikelet of ear just visible above flag leaf ligule
GS55 Half of ear emerged above flag leaf ligule
GS59 Ear completely emerged above flag leaf ligule

Flowering (GS60 to GS69)

GS61 Start of flowering
GS65 Flowering halfway
GS69 Flowering complete

Milk development (GS70 to GS79)

GS71 Grain watery ripe
GS73 Early milk
GS75 Medium milk
GS77 Late milk

Dough development (GS80 to GS89)

GS83 Early dough
GS85 Soft dough
GS87 Hard dough (thumbnail impression held)

Ripening (GS90 to GS99)

GS91 Grain hard (difficult to divide)
GS92 Grain hard (not dented by thumbnail)
GS93 Grain loosening in daytime

Produced for you by:

AHDB Cereals & Oilseeds
Stoneleigh Park
Kenilworth
Warwickshire
CV8 2TL

T 024 7647 8730
E comms@ahdb.org.uk
W cereals.ahdb.org.uk
@AHDB_Cereals

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