

GROWTH STAGES OF CEREALS

SEEDLING

TILLERING

WEEKS FROM SOWING – This figure will vary with climatic conditions and cereal varieties

2 weeks

2 to 3 weeks

3 to 4 weeks

4 to 6 weeks

5 to 8 weeks

7 to 12 weeks

One leaf

Two leaf

LEAF NUMBER main shoot only
Three leaf

Four leaf

Five leaf



Zadoks 11

Z 12

Z 13, 20

Z 13, 21

Z 14, 22

Z 15, 22

ONE LEAF

TWO LEAF

THREE LEAF

START OF TILLERING

EARLY TILLERING

TILLERING

When the first leaf is unfolded, the growing point from which the leaves, tillers, and ears are formed is below ground level. The first leaf has a blunt tip while all subsequent leaves have a pointed tip.

The third leaf is present, but not fully expanded.

The first tiller appears from between the leaf sheaf and the main shoot. This generally occurs between the three and four leaf stage.

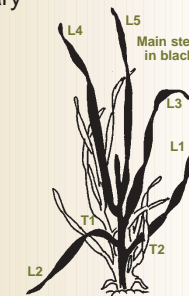
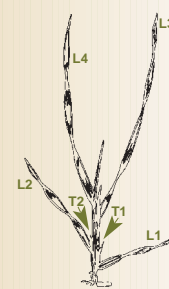
Tillers are counted separately to the main shoot.

When the main shoot has four to five leaves, two or more new tillers have formed.

Tillers continue developing through this stage. All tillers have been initiated by the time the main shoot has five to seven leaves. Secondary roots develop during tillering.

Zadoks (Z)

Zadoks decimal growth scale is based on ten cereal growth stages. These are: 0 germination; 1 seedling growth (leaves on main stem); 2 tillering; 3 stem elongation (nodes); 4 booting; 5 ear emergence; 6 flowering; 7 milk development; 8 dough development; 9 ripening. Each primary growth stage is then sub-divided into 10 secondary stages extending the scale from 00 to 99. So Z, 15, 22, 31 indicates a plant with 5 leaves on the main stem, two tillers and one node on the main stem.



Later Post Emergent herbicide application

Early Post Emergent herbicide application

Tissue testing / Sap Nitrate / NIR testing

JOINTING

BOOT

FLOWERING

GRAIN FILL

WEEKS FROM SOWING – This figure will vary with climatic conditions and cereal varieties

12 to 14 weeks
First node



Zadoks 16, 21, 31

START OF JOINTING

Jointing commences when the first node can be found on the main stem.



The first node can be found by peeling back the leaves on the main stem to expose the node underneath. You will be able to feel the swelling with your fingers

13 to 16 weeks



Z 18, 22, 37

JOINTING

As jointing progresses more leaves are produced and the young head (yellow arrow) continues to move up through the shoot. The last leaf to appear is the flag leaf.

15 to 18 weeks
Early boot



Z 19, 24, 38, 41

EARLY BOOT/ POLLEN FORMATION

The flag leaf has fully appeared (red arrow). The developing head can be felt as a swelling of the shoot between the second and third leaf from the top (yellow arrow). Flower development is nearly completed. Pollen is formed at this stage.

16 to 19 weeks
Full boot



Z 19, 24, 49

FULL BOOT

The young head swells the area between the flag leaf and the second leaf from the top (yellow arrow). In barley, triticale and awned wheats, awns (red arrow) appear at the base of the flag leaf but cannot be seen. The flowers of the young head are now fully formed.

18 to 21 weeks



Z 19, 24, 59, 61

FLOWERING (ANTHESIS)

At flowering or anthesis, final grain number has been determined. In barley, flowering occurs while the head is in the sheath.



Flowering is easily identified by the yellow anthers (red arrow) hanging freely from the ear.

25 to 28 weeks
Milk → Dough → Maturity



MILK/DOUGH TO MATURITY

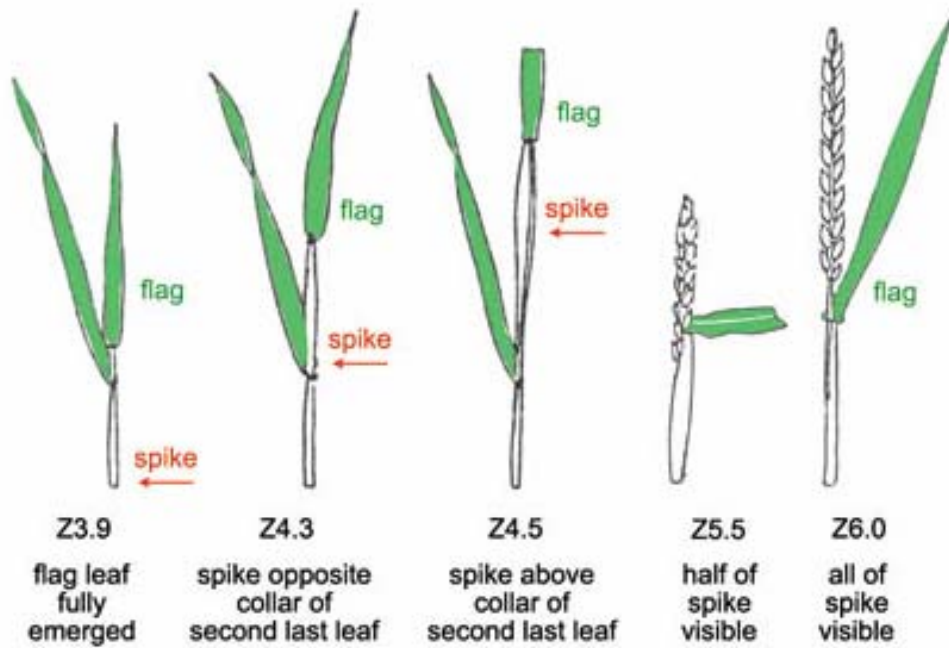
As the grains in the head develop, they go through the milk development ① then the dough stage ② before going through the ripening stage to reach maturity. ③

Source:
Rural Solutions, SA.
Reprinted 2005.

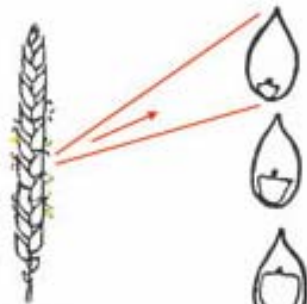


**No more Capeweed
or volunteer Legumes**

Crop at most risk from frost



based on the adaptation by M Stapper from Ann. appl. Biol. 93: 221-234



Z6.5

yellow anthers visible on 50% of the spikes

Z7.02
kernels near middle of spike extended 20%

Z7.05
kernels near middle of spike extended 50%

Z7.08
kernels near middle of spike extended 80%

Z7.1
kernels near middle watery ripe, clear liquid

Source: *Cereal Growth Stages - The Link to Crop Management* published by the GRDC - September 2005.