

## Fall Progress = Spring Potential

Winter wheat seeded in early September into a shallow seedbed is in a perfect location when moisture arrives. A rain event of 3 10ths or more will provide enough water to germinate shallow seeded winter wheat. The seedlings emerge quickly and grow for 4 to 5 weeks. The next 4 to 8 weeks (October and November) allow the plant to acclimate to the cold (harden off for the winter) and vernalize (giving the plant the signal to flower next spring). This plant would be 3 to 4 leaf, have a tiller or two with developed crown tissue and would possess winter wheat's maximum yield potential next spring.

This ideal stage may not always be reached by freeze up. Reasons for delayed fall development are usually due to one of two key factors, weather or producer error. Lack of early September rainfall delays germination of winter wheat and can inhibit plants from advancing to an ideal stage. Abnormally cool September and October weather can also limit growth. Most all other factors that affect winter wheat advancement fall into the grower's control. The two most common problems are late seeding and deep seeding. Seeding date is different depending on your area in the prairies. Optimal dates are earliest in northern and eastern areas of the prairies (Aug. 27 for Prince Albert SK.) and latest for South Western prairies (Sept. 9 for Lethbridge, Alta.). Different seeding dates are needed due to amount of warm fall weather expected to allow the plants to progress. Northern areas are expected less good fall growing time, therefore need more time in the ground to reach a suitable stage. Deep seeding increases the amount of rainfall the plant needs to germinate and slows emergence. When these two factors are combined, a significant reduction in fall growth can result, even under favorable environmental conditions. The weather can't be influenced, however seeding date and depth can help to minimize the risk associated with weather (early and shallow seeding means less rain to germinate, plants emerge and develop faster).

Crop stage entering winter has a direct impact on potential performance. Larger plants lay down more crown tissue in the fall, and therefore, they resume growth earlier and have an advantage in potential yield, competition, winter survival and maturity (affecting rust susceptibility) compared to small plants. The table shows important characteristics and their relationship to agronomy.

Stage	Date of Germination	Yield Factor 1=Low 10=High	Competition Factor 1=Low 5=High	Winter Survival FSI (514=best)	Rust Risk NonR Vars. (% Risk)	Maturity (Days Later)
<b>Not Germinated (Just imbibed)</b>	15-Oct	6 to 10	1	499	5%	0-10
<b>Sprouted (Not yet through ground)</b>	1-Oct	8 to 10	2	476	4%	0-8
<b>1-2 Leaf</b>	15-Sep	9 to 10	4	510	2%	0-4
<b>3 Leaf + Tiller</b>	5-Sep	10	5	514	1%	0

\*From the Winter Wheat Production Manual

**Yield** – A range of potential, further influenced by management and environment in spring and summer.

**Competition** – Competitive crops have early growth and strong competition with cereal and broadleaf weeds (no wild oat spray?). Resuming growth late in spring means poor competition to cereal and broadleaf weeds (full herbicide application needed).

**Field Survival Index (FSI)** – An FSI of 514 is considered adequate to survive most winters in direct seeded stubble. For every drop in FSI, the winter survival potential drops by 1% (a plant with FSI of 500 vs 514 has a 14% lower winter survival potential).

**Rust Risk and Maturity** – Late maturity may mean up to 14 days later than an “ideal” winter wheat crop. Later maturing crops are more likely at a susceptible stage in a window where rust spores can blow into the area. South Eastern areas of the prairies are at a higher risk as the spores blow in from the Central US. \*\*Only a concern in non-resistant varieties.

For all stages of winter wheat, winter survival is important but as long as adequate amounts of snow are trapped for January, February and March cold spells, the crop should be sufficiently protected. Three important things to keep in mind for your winter wheat crop next spring:

1. Taken care of weeds early to preserve the yield potential of the crop. Crops that have less competitiveness can turn out very well but they need help from herbicides.
2. Fertilizer should be applied as soon as possible in the spring. Early fertilizer gives the winter wheat plant the nutrition it needs to produce a healthy stand. If the worst-case scenario occurs and the crop is re-seeded, the re-seeded crop will use the fertilizer applied.
3. Give the crop time to recover, then perform a proper spring assessment of the crop in mid to late May after other spring crops have been seeded.

A crop with limited fall growth is at a disadvantage, but with proper, timely management and moist, cool spring weather it can still be profitable.



Seeded Sept 23  
1 leaf by freeze-up

Seeded Sept 5  
3 leaf 1 tiller by freeze-up

Plants pulled April 1, Picture taken April 11