

Wheat Growth Stage & Management Quick Guide

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Stage	Feekes	Description	Importance	Management	Zadoks
Pre-Plant at Planting			Ensure seeding depth is 1-1.5" dependent on soil moisture. Systemic seed treatments are recommended for managing aphids.	Plant certified seed and hessian fly resistant varieties, consider use of fungicide and insecticide treated seed especially for early season aphid pressure, good seedbed preparation, proper seed rate. Fertility: Soil Testing; Preplant fertilizer applications. Weed Control: Ensure weeds are not emerged at planting using tillage and/or herbicides; delayed preemergence herbicides for ryegrass (see pest control handbook).	
Germination		Dry seed, start of imbibition, imbibition complete, radicle emerged from seed (caryopsis), leaf just at coleoptile tip	Adequate soil moisture is needed for germination and emergence.	Weed Control: Delayed preemergence or spike applications for ryegrass (see pest control handbook).	00-09
Seedling Growth		First leaf through coleoptile, first leaf unfolded, 2 leaves unfolded, 3 leaves unfolded, 4 leaves unfolded, 5 leaves unfolded, 6 leaves unfolded, 7 leaves unfolded, 8 leaves unfolded, 9 or more unfolded	Check for stand establishment; late-planted wheat has less time to tiller and should be planted at a higher seeding rate to compensate.	Weed Control: Numerous postemergence herbicides may be applied (see pest control handbook). Check for soil borne diseases. Pest: ~25-35DAP insecticide application for aphid control if thresholds are met.	10-19
Tillering	1	Main shoot only, main shoot and 1 tiller, main shoot and 2 tillers, main shoot and 3 tillers, main shoot and 4 tillers, main shoot and 5 tillers, main shoot and 6 tillers, main shoot and 7 tillers, main shoot and 8 tillers, main shoot and 9 tillers, pseudostem erection	The growing point is still below the soil surface. The leaf closest to the soil surface on the pseudostem is about 1-inch from the soil surface. Wheat plants with adequate tillers are needed prior to winter dormancy to ensure maximum yield potential.	Fertility: At Feekes-2/GS-25 (January) low tiller counts (less than 80/foot ²), apply N. If tiller counts greater than 100/foot ² , apply N just before Feekes-5/GS-30. Weed Control: Many postemergence herbicides may be applied; 2,4-D application at full tiller before jointing; MCPA applications when tillering before jointing (see pest control handbook). Pest: Aphid threshold: 2+ tillers/plant: 6/row foot.	
	2				22
	3				
	4				25
	5				30
Pre-Jointing			While other states refer to this as the green-up period, Georgia wheat does not experience dormancy. Tiller production continues while often leaves express twisting as they transition to an upright growth pattern.	Fertility: If tiller counts greater than 100/foot ² , apply N just before Feekes-5/GS-30. Weed Control: 2,4-D application; MCPA application after tillering but before jointing. Pest: Insecticide treatment best at full-tiller stage.	
Jointing	6	1st detectable node	The first node is detectable. At early stages, the node will not be visible without carefully peeling the first couple of leaves from the stem. In later stages, the node becomes visible.	Fertility: Use Canopeo app to find FGCC (fractional green canopy cover). Final liquid N application before flag leaf. Weed Control: Herbicide applications should be complete before flag leaf emergence. F6-F7: N can be applied if wet weather prevented earlier application but equipment can potentially cause damage.	31
	7	2nd detectable node	The growing point is above the soil surface. Risk of injury (cold, freeze, herbicide, mechanical, etc.) negatively affecting yield increases.		32-36
	8	3rd detectable node, 4th detectable node, 5th detectable node, 6th detectable node, flag leaf visible	Only 4 nodes may develop in modern varieties.		37

Stage	Feekes	Description	Importance	Management	Zadoks
Stem Elongation/Flag Leaf	9	Flag leaf ligule and collar visible	Determining flag leaf: 75-80% of a wheat plants' photosynthesis (energy to fuel grain fill) occurs in the flag leaf.	Pest: Aphid threshold: 2 aphids/stem, 5 aphids/flag leaf. Disease: Scout for foliar disease (stripe rust and powdery mildew are most common) and decide on foliar fungicide.	39
Booting	10	Flag leaf sheath extending, boot swollen, flag leaf sheath opening, first visible awns	Seed head protrusion in main shoots.	Disease: Scout for late-season diseases, blotches and rusts (stagonospora leaf blotch and leaf rust are most common).	41-49
Head (Inflorescence) Emergence	10.1	First spikelet of head visible	The wheat head has completely emerged.	Pest: In North and East regions, apply insecticide to foliage to control cereal leaf beetle. A pyrethroid mixed with foliar fungicide is inexpensive and effective. Aphid threshold is 10 aphids/head.	50
	10.2	1/4 of head visible			52
	10.3	1/2 of head visible			54
	10.4	3/4 of head visible			56
	10.5	Head completely emerged			58
Flowering (Anthesis)	10.5.1	Beginning of flowering	The first anthers become visible. Newly emerged anthers are bright yellow. The longer the anthers have been emerged, the paler they become until they are white. Flowering begins in the middle of the head and progresses outward.	Disease: This is the optimal stage to apply fungicides to protect against head diseases such as Fusarium Head Blight. If fungicide cannot be applied at this stage it is best to apply up to 10 days after this date. Applications earlier than this stage are not as effective as applications after this stage. Apply fungicide for headscab and vomitoxin control @ 10.5.1 or shortly after.	60
	10.5.2	1/2 of flowering	Flowering complete at top of head.		64
	10.5.3	Flowering completed	All anthers are visible along the entire head. Flowering complete at bottom of head. Kernel formation in wheat head.		68
Milk Development	10.5.4	Kernel (caryopsis) watery ripe, early milk, medium milk, late milk	Noticeable increase in solids of liquid endosperm when crushing the kernel between fingers.		71-73
	11.1				75-77
Dough Development	11.2	Early dough, soft dough, hard dough	Mealy Ripe; kernel soft but dry.		83-87
Ripening	11.3	Kernel hard (hard to split by thumbnail)	Physiological Maturity.	Harvest at 11.4 with 13-15% moisture. Timing is everything.	91-99
		Kernel hard (cannon split by thumbnail)			100
		Kernel loosening in daytime			
		Overripe			
		Seed dormant			
		Viable seed has 50% germination			
		Seed not dormant			
		Secondary dormancy			
	11.4	Secondary dormancy lost			

Sources: UGA Pest Management Handbook (2024). <https://fieldreport.caes.uga.edu/publications/SB28-27/small-grains-wheat-triticale-barley-oats-and-rye/>
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