Wheat specialist advises farmers on evaluating winterkill potential

may have prompted farmers to or desiccation. wonder if that is causing any winterkill of wheat.

There are three main questions Shroyer, K-State Extension agronomy state leader and crop production specialist.

• How well has the wheat hardthrough fall and early winter gradually get colder, that helps wheat plants develop good winterhardiness, Shroyer said.

"When temperatures remain unsuddenly drop into the low teens, plants are less likely to have had time to harden properly and will be more susceptible to winterkill," he said. "This fall, temperatures have fallen off gradually and the wheat crop should be adequately hardened in most cases."

• How well developed is the root

peratures arrived with a vengeance ary roots and no tillers, they will duce soil temperatures below critin Kansas in mid-December which be more susceptible to winterkill

"Poor development of secondary roots may not be readily apparent unless the plants are pulled up and to consider when evaluating the examined," he said. "If plants are potential for winterkill, said Jim poorly developed, it may be due to poor seed-to-soil contact, dry soils, very low pH, insect damage or other causes.

ened off? When temperatures the crown level? This depends on snow cover and soil moisture. Winterkill is possible if soil temperatures at the crown level (about one inch deep) get down to 10 to 12 degrees or less, Shroyer said. If usually warm late into the fall, then there is at least an inch of snow on the ground, the wheat will be protected and soil temperatures usually remain above that level. Also, if the soil has good moisture, it's possible that soil temperatures at the crown level may not reach the critical level even in the absence of snow cover.

"But if the soil is dry and there system? Where wheat plants have is no snow cover, there may be the a good crown root system and two potential for winterkill, especially or more tillers, they will have bet- on exposed slopes or in low-lying ter winterhardiness, Shroyer said. areas, depending on the condition If plants are poorly developed go- of the plants. Air temperatures be-

MANHATTAN — Frigid tem- ing into winter, with few second- low -10 degrees can certainly reical levels when the soil is dry and there is no snow cover," he said.

To test for winterkill damage, producers can dig up a few plants, put them in pots, and bring them inside to warm up, the K-State agronomist said. If the plants do not respond to the warmer conditions, they have suffered injury.

"If plants are killed outright, • How cold did the soil get at they won't green up," Shroyer added, "but if they are only damaged, it might take them awhile to die. They will green up and then slowly go "backwards" and eventually die. There are enough nutrients in the crown to allow the plants to green up, but the winter injury causes vascular damage so that the nutrients ... cannot move, or root rot diseases move in and kill the plants. This slow death is probably the most common result of winter injury on wheat."

> Direct cold injury is not the only source of winter injury, he added.

"Under dry conditions, wheat plants may suffer from desiccation," he said. "This can kill or weaken plants, and is actually a more common problem than direct cold injury.'

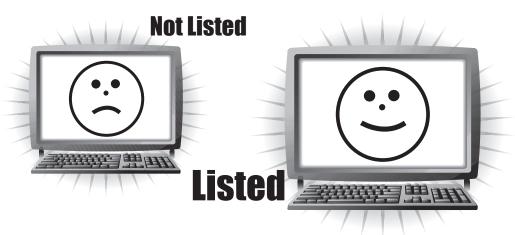
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	1 Dr. Rubinowitz Oncology Cardiac Rehab	2	3 Diabetic Clinic Echocardiograms Ultrasounds Cardiac Rehab	4 Dr. Reeves Podiatry MRI Mobile Unit Vasc Ultrasounds	Dr. Reeves Podiatry Cardiac Rehab Echocardiograms Ultrasounds	6	
7	8 Cardiac Rehab	9	10 Dr. Frankum Surgery Diabetic Clinic Echocardiograms Ultrasounds Cardiac Rehab Mammograms	11 MRI Mobile Unit Vasc Ultrasounds	12 Cardiac Rehab Echocardiograms Ultrasounds	13	
14	15 Cardiac Rehab	16	17 Dr. Curtis Cardiology Diabetic Clinic Cardiac Rehab Echocardiograms Ultrasounds	18 Dr. Saba Orthopedics MRI Mobile Unit Vasc Ultrasounds	19 Cardiac Rehab Echocardiograms Ultrasounds	20	
21	I		24 Echocardiograms Ultrasounds Cardiac Rehab	25 Merry Christmas	26	27	
28	29 Cardiac Rehab	30	31 Cardiac Rehab Echocardiograms Ultrasounds	Hap	py New 2009.	Year	
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OCAL TU IISTINGS



SUNDAY DECEMBER 21

	6 AM	6:30	7 AM	7:30	8 AM	8:30	9 AM	9:30	10 AM	10:30	11 AM	11:30	
KLBY/ABC 4 6		ouch With Dr. Good Morning les Stanley (N) America (N) (CC)		This Week Stephano	This Week-George Hour of Po		ower (CC)	Paid Program	Paid Program	First United Methodist Church			
KSNK/NBC 8 8	(Off Air)	Paid Program	Today (N)	(CC)	Meet the F (CC)	Meet the Press (N) F (CC)		Paid Program	Your Bible	Paid Program	Paid Program	Paid Program	
KBSL/CBS	Paid Program	Newspr- ing TV	Cake (EI) (CC)	Horse- land (EI)	CBS News (N) (CC)	Sunday N	lorning	Face the Nation	Dino Squad	Sushi Pack (EI)	NFL Toda James Bro		
K15CG 2	Euro. Journal	Barney- Friends	Ninos en-Casa	Plaza Ses	Kinder- garten	Mama- Movies	Wish- bone (EI)	Saddle Club	Animalia	Keeping Kids	Wealth- Track	To the Contrary	
ESPN 28	Football Final	NFL Matchup	SportsCei (CC)	nter (Live)	Outside Lines	Sports Reportrs	SportsCer (CC)	nter (Live)	NFL Coun	tdown (Liv	e) (CC)		
USA 37	Paid Program	Chang- ing	Ed Young	Joel Osteen	Movie: Sh older millio	Movie: Shopgirl (2005) A bachelor and an older millionaire court the same woman.				Movie: Along Came Polly ** (2004, Romance-Comedy) Ben Stiller. (CC)			
TBS 38	Movie: Saving Silverman ★ (2001, Comedy) Jason Biggs, Steve Zahn. (CC)				Movie: RV ★★ (2006) A dysfunctional family goes on vacation. Robin Williams.				Movie: Into the Blue ★★ (2005) (PA) Four divers cross paths with drug smugglers.				
WGN 39	Paid Program	Amazing Facts	Key of David	Paid Program	Jimmy Sw (CC)	aggart		Paid Program	Whacke- d Out	Whacke- d Out	Boston Le Girls and E		
TNT (40)		/ie: Any Gi ma) <i>Al Pac</i>		y ***			(2002) A piz a distant re		Movie: Phenomenon ★★½ (1996, Drama) John Travolta, Kyra Sedgwick. (CC)				
DSC (42)	Paid Program	Paid Program	Paid Program	Paid Program			MythBusters Christmas Special		Prototype This! Deep sea diving.		Dirty Jobs Well Digger (CC)		
A&E (47)		/ Paul Newr ance man. (ewman is	Private Sessions Dustin Hoffman. The Sopranos P Barrens (CC)				The Sopra Amour Fou		The Cleaner Back to One (CC)		
HIST (48)	In the Foo Jesus	tsteps of	In the Foo Jesus	tsteps of			In the Footsteps of Jesus		Angels: Good or Evi		il Winged messengers smerize mankind.		
NICK (55)	Jimmy Neutron	Tak and Power	OddPar- ents	OddPar- ents	Spon- geBob	Spon- geBob	Barn- yard	Mighty B	Spon- geBob	Spon- geBob	Spon- geBob	Spon- geBob	
DISN (56)	The Wiggles	Johnny- Sprites	Ein- steins	Tigger & Pooh	Mickey Mouse	Mickey Mouse	lmag. Movers	Handy Manny	Handy Manny	Handy Manny	Movie: Sp ★★★ (200		
FAM (58)	'Twas Night	Rudolph's New Year				ne Red-Nosed Santa Claus Is Santa of Misfit To Comin' to Town			The Year Without a Santa Claus (CC) A Miser Brothers' Christmas (CC)				
HALL 60	Odyssey I Presents		NASCAR Angels	M*A*S*H Crisis		M*A*S*H M*A*S*H M*A*S*H M*A*S*H		Movie: Off Season ★★★ (2001) A boy believes a vacationer is really Santa Claus			A boy nta Claus.		

SUNDAY DECEMBER 21

	12 PM	12:30	1 PM	1:30	2 PM	2:30	3 PM	3:30	4 PM	4:30	5 PM	5:30	
KLBY/ABC 4 6	Paid Program	Paid Program	Paid Program	Colon Detox	Paid Program	Paid Program	Paid Program	Paid Program	Paid Program	Paid Program	ABC News	News (N) (CC)	
KSNK/NBC 8 8	Action Sp (CC)	orts Brecke	enridge, Col	o. (Live)	Golf: Chev Calif. (Live		Challenge -	- Final Rou	nd. Thousa	nds Oaks,	Storm Stories	NBC News	
KBSL/CBS		Steelers at				s, Dolphins	NFL	Paid Program	Skiing: De Celebrity S		Evening News	News (CC)	
K15CG 2	McLaug- hlin	McLaug- hlin	Theol- ogy	Religion- Ethics	Faith Hill, the World	Joy to	Healthy Body	Doctors on Call	Sewing- Nancy	Beads, Baubles	Bill Moyer Faith & Re		
ESPN 28	College Formula (CC)		Billiards: \ Semifinal	WPBA	Billiards: Semifinal	WPBA	Billiards: Champion		2008 World Series of Poker Las Vegas.		2008 World Series of Poker Las Vegas		
USA 37)	Movie: Happy Gilmore ★★ (1996) A hockey player joins the PGA tour. (CC)					e Break-U r Comedy) <i>V</i>			Psych Ch Joy (CC)	ristmas	Monk Mr Monk and the Miracle (CC)		
TBS 38	Movie: Sw (PA) John	≀ordfish ★★ Travolta, H	r½ (2001, S ugh Jackma	Suspense) an. (CC)	Movie: Tru of a spy ar	ue Lies ★★ nd a family i	★ (1994, Adman. <i>Arnold</i>	ction) A mai d Schwarze	n lives the c	louble life	Movie: Men in Black II ★★ (2002)		
WGN 39		i ristmas at eshia Knight			Movie: I'll Be Home for Christmas ★½ (1998, Comedy) Jonathan Taylor Thomas. (2002, Docudrama) Jason Alexande								
TNT (40)	(10:00) Movie:	Movie: Ma amazing al	i tilda (1996 bilities agair							Movie: The Wizard of Oz ★★★★ (1939) Judy Garland.			
DSC 42	Time Warp	Time Warp	Survivorm	nan		Man vs. Wild MythBusters Everglades (CC) Shredded Plane			MythBust honored sa		Dirty Jobs Exotic Animal Keeper (CC)		
A&E (47)	The Clean Little Word		The Clean With Me (C		Cold Case Files (CC) Cold Case Files			Files	Cold Case (CC)	Files	CSI: Miami Golden Parachute (CC)		
HIST (48)		of Christm ruth about the			Christmas Unwrappe	hristmas Star Wars: The Legacy Revealed Lucas' rous fantasy milestone. (CC)				'70s Feve	70s Fever (CC)		
NICK (55)	Jimmy Ne Boy Geniu		Barn- yard	Barn- yard	Zoey 101	(CC)	Drake & Josh	Drake & Josh	Drake & Josh	Drake & Josh	Drake & Josh	Drake & Josh	
DISN 56	(11:00) Movie:	Zack & Cody	Zack & Cody	Zack & Cody	Cory in House	Cory in House	Phineas and Ferb	Phineas and Ferb	Zack & Cody	Zack & Cody	Wizards- Place	Wizards- Place	
FAM 58		e Incredibl A former su											
HALL 60		e Note (200 to deliver a				Movie: A Grandpa for Christmas (2007) Movie: Our First Christmas (2007) Movie: Our First Christmas (2007) Drama) John Ratzenberger. (CC)							

SUNDAY DECEMBER 21

	6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30	
KLBY/ABC	America's Home Vid		Extreme N Home Edi					Desperate Housewives (CC)		KAKE Sports	Lawyer on Line	Paid Program	
KSNK/NBC 8 8	Football N America (NFL Footl (CC)	oall: Carolina Panthers at New York Giants. G			iants Stadi	um. (Live)	News (N)	Monk Mr. the Missin			
KBSL/CBS	60 Minutes (CC) Million Passw			llar (N) (CC)	Cold Case (N) (CC)	Wings	The Unit Switchblade (CC)		News (N) (CC)	News (N)	Catch it Kansas	Whacke- d Out	
K15CG	O Christmas Tree (CC) (DVS) Nature Ch Yellowston				Masterpie Suspect: T	ce Contem The Final Ac	porary Prir t (CC) (DV	me S)	Rare Visions	Mystery! I Wishes We	Inspector Ly ere Horses	/nley: If	
ESPN 28	SportsCei (CC)	nter (Live)		ootball: R& lew Orleans		New Orlean	s Bowl So	outhern Mis	sissippi	SportsCei	nter (Live) (CC)		
USA 37	House Who's Your Daddy? (CC) House alien at						House Meaning Law & (CC) Crimina				Movie: Happy Gilmore ★★ (1996)		
TBS 38	(5:15) Mov in Black II							e: Sahara ★★ ½ (2005) Adve ederate ship in Africa. <i>Matth</i>					
WGN 39	WKRP in Cin.	WKRP in Cin.	Newhart (CC)	Newhart (CC)	Honey- mooners	Honey- mooners	WGN News	Instant Replay	Be- witched	Be- witched	Dream- Jeannie	Dream- Jeannie	
TNT (40)	(4:45) Mov Wizard of			urs, Mine & Dennis Qu			e Wizard o				Movie: Ju ★★½ (199		
DSC (42)	Dirty Jobs Before Gre		Dirty Jobs Farm (CC)		Dirty Jobs Maggot Farmer (CC)		Dirty Jobs Sheep Castrator (CC)		Dirty Jobs (CC)		Dirty Jobs Egg Farm (CC)		
A&E (47)	CSI: Miam Suspicion		CSI: Miam (CC)				CSI: Miam Kill (CC)	i Born to	CSI: Miami Urban Hellraisers (CC)		CSI: Miami Nailed (CC)		
HIST (48)	(5:00) '70s (CC)	00) '70s Fever Modern Marvels C) Behind the scene					Ancient Discoveries (CC)		Decoding the Past Paradise lost. (CC)		Modern Marvels Walt Disney World		
NICK 55	Drake & J Really Big		H2O (CC)	Zoey 101 (CC)	News Special	Home Improve.	George Lopez	George Lopez	Family Matters	Family Matters	Home Improve.	Home Improve.	
DISN 56	Zack & Cody	Hannah Montana	Hannah Montana	Wizards- Place		y Kids 3: 0 (2003, Adv		Zack & Cody	Zack & Cody	Hannah Montana	That's- Raven	Cory in House	
FAM (58)		vie: The Inc 04, Advent			rs ★★★ (2006, Comedy) Animated. A race randed in a town along Route 66. (CC)				The Year Without a Santa Claus (CC)		Joel Osteen	Feed the Children	
HALL 60		e Note (200 to deliver a				Movie: A Boyfriend for Christmas (2004, Romance-Comedy) Kelli Williams.					n American Girl nnaSophia Robb.		

MONDAY DECEMBER 22

	6 PM	6:30	7 PM	7:30	8 PM	8:30	9 PM	9:30	10 PM	10:30	11 PM	11:30	
KLBY/ABC 4 6	News (N) (CC)	Enter- tainment	Shrek the Halls	Movie: Ch (2005, Far			ate Factory C)	***	News (N) (CC)	Nightline (N) (CC)	Jimmy Ki Tom Cruis		
KSNK/NBC 8 8	News (N)	Wheel of Fortune	Holiday M Home Vid				President I suitability of		News (N)	The Tonic With Jay		Late Night	
KBSL/CBS	News (N) (CC)	Inside Edition	Big Bang Th	How I Met	Two/Half Men	Worst Week	CSI: Miam in the Mist	i Guerillas (CC)	News (N) (CC)	Late Show David Let		Late Late	
K15CG 2	The News With Jim I		Antiques Roadshov	v (CC)	The Life a Built: The		The Birth (CC)	of Christ	World News	This Is America			
ESPN 28	Monday N (Live) (CC)	ight Count	down	NFL Footh Field. (Live		Bay Packer	rs at Chicaç	go Bears. S	oldier	SportsCe	nter (Live) (CC)		
USA 37)	NCIS The Web (CC)	Voyeur's	House Autopsy (WWE Monday Night Raw (Live			Psych Chr Joy (CC)		ristmas Law & Ord Criminal I			
TBS 38	Seinfeld (CC)	Seinfeld (CC)	Family Guy (CC)	Family Guy (CC)	Family Guy (CC)	Family Guy (CC)	Name Is Earl	Name Is Earl	Friends (CC)	Funniest the Year:		Sex and the City	
WGN 39	7th Heave Comes Sa			Flintstones Fred plays Santa. (CC)		Special WGN Ne (N) (CC)		News at Nine Scrubs (CC)		Scrubs (CC)	The Bob & Show (CC		
TNT 40	Law & Ord Embedded		Law & Ord Dead Wive		Law & Order Ghosts (CC) (DVS) Law & Ord Invaders ((CC) (DVS) Kin (Part 2						
DSC 42	Bear Feed Frenzy (C		Jesus: Th Complete		Jesus: The Complete Story		Jesus: The Complete Story		Noah's Ark: The True Story (CC)		Jesus: The Complete Story		
A&E 47	CSI: Miam in a Flash		Intervention (CC)	on Derek			Runa- way	Manhun- ters	Manhun- ters	Manhun- ters	Interventi (CC)	on Derek	
HIST 48	Batman To	ech (CC)	Modern M Super Hun		Cities of the Underworld (CC)		Ancient Disc.		American Holiday foo				
NICK 55	Drake & Josh	Drake & Josh	Spon- geBob	Spon- geBob	Home Improve.	Home Improve.	George Lopez	George Lopez	Family Matters	Family Matters	Home Improve.	Home Improve.	
DISN 56	Zack & Cody	Hannah Montana	(2003, Dra	,	. Linz.	Phineas and Ferb	Wizards- Place	Life With Derek	Zack & Cody	Hannah Montana	That's- Raven	Cory in House	
FAM 58		vie: The Po *★★ (2004,	lar Fantasy)	Movie: Th Animated.	e Polar Express *** (2004, Fantasy) A conductor guides a boy to the North Pole.				The 700 Club (CC)		Feed the Children		
HALL 60	Walker, Te Ranger (C		Walker, Te Ranger (C		Movie: Mo Drama) <i>Ca</i>	onlight an andace Can	d Mistletoe neron Bure.	(2008, (CC)	Movie: Pa Scott Baku	apa's Angels ★★ (2000, Drama) cula, Eva Marie Saint. (CC)			

7 Other CFP 12/19/08.indd