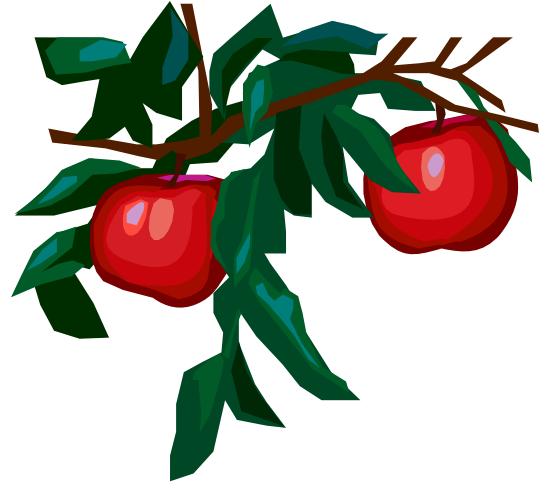


EB0913

CRITICAL TEMPERATURES FOR BLOSSOM BUDS

APPLES



The temperature at which fruit buds are injured depends primarily on their stage of development. Buds are most hardy during the winter when they are fully dormant. As they begin to swell and expand into blossoms, they become less resistant to freeze injury.

Not all blossom buds are equally tender. Resistance to freeze injury varies within trees as it does among orchards, varieties and crop years. Buds which develop slowly tend to be more resistant and as a result, some buds usually are killed at higher temperatures, while others are resistant at much lower temperatures. To indicate this range, researchers developed a set of temperature values based on data collected at the Washington State University Prosser Irrigated Agriculture Research and Extension Center. It shows the average temperatures required to kill 10% and 90% of the buds, respectively.

In determining the need for frost control, orchardists should factor in the range in temperatures at which buds are killed. Orchards having a large number of buds should withstand more frost than those having only a light set of buds.

Also consider the weather conditions preceding cold nights when looking at critical temperatures. Prolonged cool weather tends to increase bud hardiness during the early stages of bud development.

James K. Ballard, former Washington State University Cooperative Extension agent, Yakima County; *E. L. Proebsting*, former WSU horticulturist; and *Ronald B. Tukey*, WSU Cooperative Extension horticulturist, deceased. Photos 1-6 by *P. J. Chapman*, New York State Agricultural Experiment Station; photos 7 and 8 by *Curtis Strausz*, Yakima County grower; and photo 9 by *Harlan Mills*, former WSU Senior Experimental Aide.

Alternate formats of our educational materials are available upon request for persons with disabilities. Please contact the Information Department, College of Agriculture and Home Economics, Washington state University for more information. WSU Cooperative Extension bulletins contain material written and produced for public distribution. You may reprint written material, provided you do not use it to endorse a commercial product.

Issued by Washington State University Extension and the U.S. Department of Agriculture in furtherance of the Acts of May 8 and June 30, 1914. Cooperative Extension programs and policies are consistent with federal and state laws and regulations on nondiscrimination regarding race, color, gender, national origin, religion, age, disability and sexual orientation. Evidence of noncompliance may be reported through your local Cooperative Extension office. Trade names have been used to simplify information; no endorsement is intended.

Published July 1981. Reprinted March 1998.



1 – Silver Tip



2 – Green Tip



3 – Half-inch Green



4 – Tight Cluster



5 – First Pink



6 – Full Pink



7 – First Bloom



8 – Full Bloom



9 – Post Bloom

APPLES

Critical Temperatures for Blossom Buds*

<u>Bud Development Stage</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>
Old Standard Temp. ¹	16	16	22	27	27	28	28	29	29
Avg. Temp for 10% Kill ²	15	18	23	27	28	28	28	28	28
Avg. Temp for 90% Kill ²	2	10	15	21	24	25	25	25	25
Average Date (Prosser)	--	3/20	3/27	4/3	4/8	4/11	4/18	4/25	--

*For Red Delicious. Golden Delicious and Winesap approximately 1 degree hardier; Rome Beauty, 2 degrees hardier; except after petal fall, when all varieties are equally tender.

¹ Critical temperatures as previously published

² Average temperatures found by research at the WSU Research and Extension Center, Prosser, to result in 10% and 90% bud kill.

² Average date for this stage at the WSU Research and Extension Center