

A NEW METHOD OF CLASSIFYING CROP GROWING SEASONS
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Military planning for World War II demanded a great deal of specific information in regard to the agriculture of target and occupational areas. In general, weather data were more readily available than crops information. This created a demand for rapid methods of interpreting intelligence weather data in terms of crop-plant response. Accurate information in regard to the periodic development of crops in proposed operational areas also was needed. Agricultural specialists were brought in to supply and interpret this information.

This paper describes a method of classifying crop growing seasons which helped to simplify the training and briefing problem. It is based on generally accepted principles of crop-weather relationships, and upon the spare-time crop and weather studies conducted by the author prior to the War, and reported to the American Meteorological Society and the Utah Academy of Science in 1942 and 1943.

Roman numerals, I to V are used to indicate the relative length of the growing seasons. The capital letters A, B, and C are used to indicate warm, moderate, and cool temperature climates. Significant seasonal variations are indicated by a combination of "heat" symbols. Where low temperatures, especially low night temperatures, are an important factor in crop adaptation, small letter symbols are used. The complete symbol conveys important information in regard to crop-temperature adaptation, and permits rapid comparison of growing season climates in various parts of the World. Colored growing season classification maps and temperature graphs representing points in the United States and Japan are presented for comparison. -----George L. McColm, Soil Conservationist, Land-Use Planner, Navajo Service, Shiprock, New Mexico. (The Material presented in this paper was prepared prior to the author's employment by the Indian Service. It is not an official document of the United States Department of the Interior, or any other Government Agency. No material now classified by the Navy or Army is involved)

Classifications and Length of The Crop Growing Seasons in The
United States. 1948

Season Class	Station	Hardy Crops		Tender Crops	
		Spring	Fall	Spring	Fall
I $\bar{B}\bar{C}$	Hypoluxo, Fla.	Nov.8	- Apr.21	Year	- long
I $\bar{B}\bar{C}$	Brandenton, Fla.	Oct.20	- May.8	Year	- long
I $\bar{B}\bar{C}$	Brownsville, Texas	Oct.17	- Apr.7	Year	- long
I $\bar{A}c\bar{w}$	Green land Ranch, Cal.	Oct.20	- Apr.12	Mar.7-	Nov.12
I $\bar{A}c\bar{w}$	Indio, Calif.	Oct.19	- Apr.23	Mar.6-	Nov.11
I $\bar{A}c\bar{w}$	Phoenix, Ariz.	Oct.14	- May.4	Mar.22-	Nov.7
I $\bar{B}c$	Charles' ton, S. Carolina.	Sept.27-May.16		Mar.20-	Nov.10
I $\bar{B}c$	Hattiesburg, Miss.	Sept.24-May.16		March.24-	Nov.1
I $\bar{B}c$	Houston, Texas	Oct. 2	-May.5	Mar.2	-Nov.20
I $\bar{B}c$	Gainsville, Fla.	Oct.12-	May.10	Feb.28-	Dec.1
I $\bar{B}c$	New Orleans, La.	Oct.10	-May.10	March.2-	Dec.3
I $\bar{B}c$	Pensacola, Fla.	Oct.4	- May.14	Feb.11-	Dec.8
I $\bar{C}c$	San Diego, Calif.	Year	- Long	Apr.28-	Nov.16
II $\bar{A}c\bar{w}$	Bakersfield, Cal.	Feb.3-June.2		Apr.20-	Oct.20
		Sept.20-	Dec.1		
II $\bar{A}c\bar{w}$	Logandale, Nevada	Feb.15-May.20		Apr.20-	Oct.12
		Sept.5-	Nov.27		
II $\bar{B}c$	Abilene, Tex.	Feb.23-May.22		Mar.29-	nov.1
II $\bar{B}c$	Little Rock, Arkansas	Sept.25-Nov.30		Apr.2	- Nov.1
		Mar.8-June.3			
		Sept.16-	Nov.20		
II $\bar{B}c$	MsAlister, Okla.	Mar.4	- june.11	Apr.8	- Oct.22
		Sept.20-	Nov.19		
II $\bar{B}c$	Monroe, Louisiana	Feb.4-May.20		Mar.20-	Nov.1
		Sept.25-	Dec.5		
II $\bar{B}c$	Vicksburg, Miss.	Feb.4-May.12		March.17-	Nov.3
		Sept.20-	Dec.1		
II $\bar{B}c$	Montgomery, Ala.	Jan.30 to May.16		March.14-	Nov.9
		Sept.12 to	Dec.12		
II $\bar{B}c\bar{w}$	Carlsbad, N.Mex.	Feb.25	- May.25		
		Sept.10-	Nov.22	Apr.23-	Oct.12
II $\bar{B}c$	Atlanta, Ga.	Mar.6	- June.2		
		Sept.12-	Nov.21	Apr.12-	Oct.24
II $\bar{B}c$	Columbia, S.Carolina	Feb.22-May.26		Apr.1	- Oct.30
		Sept.20-	Dec.3		
II $\bar{B}c$	Nashville, Tenn.	Mar.15	- June.3	Apr.16	- Oct.17
		Sept.4	- Nov.12		
II $\bar{B}c$	Wilmington, N.C.	Feb.26	- June.9	Apr.1	-Nov.7
		Sept.17-	Dec.6		
II $\bar{B}c\bar{w}$	Stockton, Calif.	Feb.15	- June.15	Apr.28	-Oct.20
II $\bar{C}c$	San José, Cal.	Feb.14	- Dec.4	June.1	-Oct.14
II $\bar{C}c$	Salinas, Calif.	Jan.30	- Dec.20	May.23	- Oct.6
III $\bar{B}c$	Wichita, Kansas	Apr.1	- June.13	Apr.20	- Oct.13
		sept.10	- Nov.3		
III $\bar{B}c$	Amarillo, Texas	Mar.28	- June.20	Mayo.2	-Oct.10
		Sept.1	- Nov.5		

<u>Season Class</u>	<u>Station</u>	<u>Hardy Crops</u>		<u>Tender Crops</u>	
		<u>Spring</u>	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>
IIIBc	Bethany, Missouri	Apr. 14 -	June 27	May. 7 -	Oct. 1
IIIBc	Havana, Illinois	Aug. 21 -	Oct. 26	May. 6 -	Oct. 5
		Apr. 10 -	June 28		
		Aug. 20 -	Oct. 28		
IIIBc	Indianapolis, Ind.	Apr. 9, July. 1/Aug. 20 to			
		Oct. 28.			Apr. 29-Oct. 11
IIIBc	Lincoln, Nebr.	Apr. 14 to	July. 1	May. 6 -	Oct. 4
		Aug. 20 -	Oct. 26		
IIIBc	Manhattan, Kans.	Apr. 3 -	June 13	May. 2 -	Oct. 5
		sept. 1 -	Oct. 31		
IIIBc	Marion, Kentucky	Mar. 17 -	Nov. 11	Apr. 20 -	Oct. 16
IIIBc	Marshall Town, Iowa	Apr. 17 -	July. 10	May. 15 -	Sept. 29
		Aug. 10 -	Oct. 15		
IIIBc	Portsmouth, Ohio.	Apr. 6 -	June. 26	May. 4 -	Oct. 3
		Aug. 20 -	Nov. 1		
IIIBc	Richmond. Va	Mar. 27 -	June. 12	Apr. 25 -	Oct. 15
		Aug. 27 -	Nov. 10		
IIIBc	Washington, D.C.	Apr. 10 -	June. 18	Apr. 28 -	Oct. 13
		Aug. 25 -	Nov. 3		
IIIBcw	Colby, Kansas	Apr. 13 -	July 1	May. 25 -	Sept. 20
		Aug. 20 -	Oct. 23		
IIIBcw	Grand Junction, Colorado.	Apr. 7 -	June. 21	May. 15 -	Sept. 27
		Aug. 20 to	Oct. 22		
IIIBcw	Lamar, Colo	Apr. 7 -	June. 16	May. 17 -	Sept. 22
		Aug. 25 -	Oct. 27		
IIIBcw	Moab, Utah.	Apr. 1 -	June. 20	May. 25 -	Sept. 16
		Aug. 20 -	Oct. 27		
IIIBcw	Socorro, New Mexico	Mar. 21 -	Nov. 13	May. 18 -	Sept. 23
IIIC	Albany, N.Y.	Apr. 24 -	Oct. 19	May. 13 -	Oct. 1
IIIC	Bridgeton, N.J.	Apr. 8 -	Nov. 3	May. 5 -	Oct. 11
IIIC	Flint, Michigan	May. 4 -	Oct. 17	May. 30 -	Sept. 27
IIIC	Ft. Wayne., Indiana	Apr. 20 -	Oct. 26	May. 13 -	Oct. 1
IIIC	Gardiner, Maine	May. 5 -	Oct. 10	May. 31 -	Sept. 19
IIIC	Huron, S. Dak.	Apr. 26 -	Oct. 10	May. 26 -	Sept. 15
IIIC	Madison, Wisconsin	Apr. 25 -	Oct. 14	May. 14 -	Oct. 1
IIIC	Miles City, Montana	Apr. 27 -	Oct. 12	May. 28 -	Sept. 14
IIIC	New Bedford, Mass.	Apr. 30 -	Oct. 20	May. 14 -	Oct. 3
IIIC	New Haven, Conn.	Apr. 23 -	Oct. 27	May. 13 -	Oct. 6
IIIC	New Ulm, Minnesota	Apr. 28 -	Oct. 10	May. 23 -	Sept. 17
IIIC	Santa Fe, N. M.	May. 1 -	Oct. 20	June. 4 -	Sept. 20
IIIC	State College, Pa.	Apr. 22 -	Oct. 18	May. 17 -	Sept. 27
IIIC	Tiffin, Ohio	Apr. 20 -	Oct. 25	May. 17 -	Oct. 2
IIIC	Waynesville, N.C.	Apr. 4 -	Oct. 28	May. 12 -	Sept. 29
IIICw	Baise, Idaho	Apr. 18 -	Oct. 20	May. 29 -	Sept. 14
IIICw	Deseret, Utah	Apr. 23 -	Oct. 13	June. 19 -	Aug. 29

<u>Season Class</u>	<u>Station</u>	<u>Harvest Crops</u>		<u>Long Season</u>	
		<u>Spring</u>	<u>Fall</u>	<u>Spring</u>	<u>Fall</u>
III $\bar{C}$ w	Placerville, Cal	Apr.3 - Nov.3		June.24 - Sept.4	
III $\bar{C}$ w	Prescott, Arizona	Apr.16- Oct.28		June.16 - Sept.12	
III $\bar{C}$ w	Reno Nevada,	Apr.20- Oct.15		June.15 - Sept.1	
III $\bar{C}$ w	St. Johns, Ariz.	Apr.11- Oct.24		June.14 - Sept.8	
III $\bar{C}$ w	Spokane, Washington	Apr.20- Oct.10		June.1 - Sept.12	
III $\bar{C}$ w	Wheatland, Wyoming	May.1 - Oct.13		June.10 - Sept.8	
IIIC	Portland, Oregon	Apr.7 - Nov.3		May.20 - Oct.10	
IIIC	Seattle, Washington	Apr.15- Oct.23		May.1 - Sept.15	
IIIC	Eureka, Calif.	Apr.20- Nov.23		NO	
<u>IVC</u>	Duluth, Minnesota	May.20- Sept.28		June.15 - Sept.5	
<u>IVC</u>	Marquette, Michigan	May.19- Oct.1		June.10 - Sept.18	
<u>IVc</u>	Presque Isle, Maine	May.14- Sept.28		June.27 - Aug.30	
<u>IVc</u>	Juneau, Alaska	May.25- Sept.14		NO	
<u>IVcw</u>	Alturas, Cal.	May.10- Oct.10		NO	
<u>IVcw</u>	Baker, Oregon	May.14- Oct.4		June.28 - Aug.20	
<u>IVcw</u>	Heber, Utah	May.7 - Oct.2		NONE	
<u>IVcw</u>	Kalispel, Montana	May.12- Sept.26		June.28 - Aug.16	
<u>IVcw</u>	Pembina, N. Dak.	May.9 - Sept.25		June.11 - Aug.22	
<u>IVcw</u>	San Luis, Colo.	May.17- Sept.29		NONE	

CROP GROWING SEASON CLASSIFICATION

(A worldwide classification of temperature climates in relation to crop adaptation)

The Roman Numerals I to VI indicate the length of the crop growing season -- the letter symbols indicate the heat characteristics of the growing season climate.

- CLASS I. ---- Year-long crop growing season (average minimum temperatures over 1.6°C (35°F), with average temperatures over 10°C (50°F)
- CLASS II -- Eight to twelve months growing season
- CLASS III-- Five to eight months growing season
- CLASS IV -- Two and one-half to five months growing season
- CLASS V --- Less than two and one-half months growing season
- CLASS VI -- No growing season for commercial crops. Year-long average minimum temperatures below 1.6°C (35°F)

A Heat Symbol indicates a period of two months or more with similar temperatures. Long growing seasons may have more than one symbol. (For example: "Ac" - The "A" indicates a high temperature season suitable for heat tolerant crops, the "c" indicates a cool period suitable for hardy cold-tolerant crops.)

- A ---- Average maximum temperatures over 40°C (104°F)
(Grow only the most heat tolerant crops)
- A ---- Average maximum temperatures between 35 C (95 F), and 40°C (104°F); (Grow only heat tolerant crops)
- B ---- Average maximum temperatures below 35°C (95°F), with average temperatures over 25.5°C (78°F) Grow high temperature-tolerant crops --cool temperature crops not adapted.
- B ---- Mean average temperatures 22.8°C (73°F) to 25.5°C (78°F), with average minimum temperatures over 9°C (48°F) Grow tender crops and heat tolerant hardy crops.
- C ---- Mean average temperatures 18.4°C (65°F) to 22.8°C (73°F), with average minimum temperatures over 9°C (48°F) Grow cold tolerant tender crops and most hardy crops.
- C ---- Mean average temperatures 15.5°C (60°F) to 18.4°C (65°F), with average minimum temperatures over 9°C (48°F) Grow nearly all the hardy crops and very cold-tolerant tender crops.
- c ---- Mean average temperatures 10°C (50°F) to 15.5°C (60°F), and/or average minimum temperatures between 1.6°C (35°F) and 9°C (48°F) (Grow hardy cold-tolerant crops)
- T ---- Tropical climate. Average minimum temperatures above 15.5°C (60°F) year-long.
- W ---- Wide spread between average maximum and average minimum temperatures --symbol indicates spread over 15°C (27°F) An important factor in crop adaptation.

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