

Growing Grapes In Minnesota

By The Minnesota Grape Growers Association

Copyright 2016 Minnesota Grape Growers Association

All rights reserved

Printed in the United States of America

The original manuscript of this booklet was prepared by David MacGregor.

Second Edition 1978 revised by John Marshall, Jim Bird, Charlie Knox and Pat Pierquet.

Third Edition 1981 revised by Robin Partch, David MacGregor, Pat Pierquet and Carolyn Barrett.

Fourth Edition 1986 revised by Dr. Robert Tomesh, David MacGregor, Peter Hemstad, and Otto Kral.

Fifth Edition 1991 revised by Peter Hemstad and Tom Plocher.

Sixth Edition 1993 revised by Tom Plocher with layout design by Joel Girardin.

Seventh Edition 1999 revised by Gary Mogren, Peter Hemstad, John Marshall and Mark Hart.

Eighth Edition 2006 revised by John Marshall and Lisa Smiley.

Ninth Edition 2011 revised by John Marshall, Tom Martell, and Cheri Anderson.

Tenth Edition 2016 revised by Paul Domoto and Cheri Anderson

Cover design by Design Ink with credits to University of Minnesota Agricultural Experiment Station (David Hansen-photographer), John Falconer (Winter scene), Mark Hart, and Ron Barnes.

Training system artwork by Tim Trost www.timtrost.com

This publication was supported by the Specialty Crop Block Grant Program at the U.S. Department of Agriculture (USDA) through Grant Agreement Number 14-SCBGP-MN-0027. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA.

Preface to the Tenth Edition

The continuing demand for Growing Grapes in Minnesota by growers, extension services, foreign affiliates, libraries, and others since the original publication has been encouraging to the members of the Minnesota Grape Growers Association. This is the tenth revision of the original text, and includes Best Management Practices inserted into each section.

The objective in all editions has been to provide updated information regarding cold climate viticulture and to update the text with new practical and technical developments. This edition also has been updated with current facts and figures, and introduces best management practices to enable growers to rate their current practices to the expectations of a well-managed vineyard. It is hoped that the material presented will be a useful reference and practical guide to grape growing in northern regions with severe winters.

For additional copies of this book or if interested in becoming a member of the Minnesota Grape Growers Association, please visit www.mngrapes.org.

Table of Contents

Introduction	1
Considering Growing Grapes?	
Marketing	
Site Requirements for Grapes	
Minnesota’s Macroclimate.....	2
Site Selection and the Mesoclimate.....	
Soil Requirements for Grapes.....	3
Soil Physical Properties.....	
Soil Chemical Properties.....	
Other Site Requirements	
Vineyard Economics	5
Grape Cultivars for Minnesota	
Starting the Vineyard	
Soil Preparation For Planting	6
Planting Design and Row Spacing	8
Planting	9
Parts of The Vine	10
First Season Care	11
Second Season Care	13
Care of Established Vineyards	
Vine Canopy Objectives.....	14

Choosing A Training System.....	15
Building the Trellis	
Pruning	24
Canopy Management	30
Fertilization and Nutrition	38
Weed Control and Vineyard Floor Management	34
Weed control between the rows.....	
Weed control under the vines.....	
Sucker management with herbicides.....	
Preventing Herbicide Drift and Injury to Grapes.....	
Winter Protection for Tender Cultivars	43
Vineyard Pest Management	
Applying Pesticides	
Grape Diseases	47
Insect Pests of Grapes	54
Wildlife Pests of Grapes.....	60
Grape Maturation and Ripening	
Changes occurring during the ripening process	
Testing grape maturity	
Making Wine from Minnesota Grown Grapes	68
Basic Recipe for One Gallon of Grape Wine.....	69
Resources	
Sources for Grapevines	67

Wineries	70
Winemaking Supplies.....	71
Soil and Plant Analysis Laboratories	
Extension Specialists.....	71
Vineyard Supply Sources	72
Recommended Reading.....	72
Web Resources	
References	73

Introduction

Grapes are not new to Minnesota. Wild grapes (*Vitis riparia*), are found everywhere along our rivers and lakes extending into the Dakotas and parts of Canada. In fact, table grape production developed in this area as early as 1880-1900, growing mostly Concord and Delaware Grapes. A USDA estimate indicates that the Minnesota pioneer grape crop reached its peak in 1900, with production of 600,000 lbs. of grapes. Unfortunately, this early industry soon declined, due to the development of transcontinental rail transportation, the resulting economic competition from California vineyards, the severity of local winter temperatures, and introduction of growth regulator (phenoxy) herbicides such as 2,4-D in the mid-1940's.

It should be realized that limited grape cultivars (cultivated variety¹) will grow successfully in this area without special care. European (*Vitis vinifera*) grapes, those widely grown in California, usually are killed at 0 to -15 degrees F. Even Concord, the standard of hardiness for American cultivars, commonly exhibits cold injury at -20 degrees F. Most French-American hybrids can only withstand -10 to -25 degrees F. With yearly winter lows of -25 to -35 F. in Minnesota, experience has shown that very few traditional cultivars can be reliably grown here. Although special cultural practices have been developed to grow marginal vines in cold climates, the cultivars released by the University of Minnesota grape breeding program, Elmer Swenson and other cold climate private breeders have the extreme cold hardiness needed to survive without winter protection. They combine excellent cold hardiness with good wine and eating quality and are a dependable choice as new plantings are established. These cultivars have become readily available to both the commercial and home grower.

Widespread interest in growing grapes is emerging in Minnesota as well as other cold climates where grape culture has not been traditional. Wineries and vineyards are developing at a rapid pace and the demand for locally grown grapes is steadily increasing. It is an exciting time to be part of grape growing and we hope this book will help you get started growing grapes in the north!

¹ "Variety" is a botanical term to designate a variation within a species, such as the difference between a peach and nectarine that is a fuzz less mutation of a peach. The scientific name of a peach is *Prunus persica* and the nectarine is *Prunus persica* var. *nucipersica*. The term cultivar is used to distinguish a cultivated variation within a species.