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National  
Engineering  
Handbook

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# Irrigation Guide

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# Preface

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Irrigation is vital to produce acceptable quality and yield of crops on arid climate croplands. Supplemental irrigation is also vital to produce acceptable quality and yield of crops on croplands in semi-arid and subhumid climates during seasonal droughty periods. The complete management of irrigation water by the user is a necessary activity in our existence as a society. Competition for a limited water supply for other uses by the public require the irrigation water user to provide much closer control than ever before. The importance of irrigated crops is extremely vital to the public's subsistence.

Today's management of irrigation water requires using the best information and techniques that current technology can provide in the planning, design, evaluation, and management of irrigation systems. Support for many of the values included in this chapter come from field research, established design processes, and many system designs and evaluations over many years. Field evaluations must always be used to further refine the planning, design, evaluation, and management process. This design guide in the Natural Resources Conservation Service (NRCS), National Engineering Handbook series provides that current technology.

Irrigation Guide, Part 652, is a guide. It describes the basics and process for planning, designing, evaluating, and managing irrigation systems. It provides the process for states to supplement the guide with local soils, crops, and irrigation water requirement information needed to plan, design, evaluate, and manage irrigation systems.

Irrigation Guide, Part 652, is a new handbook to the family of references in the NRCS, National Engineering Handbook series. It is written for NRCS employees who provide technical assistance to the water user with concerns for both water quantity and quality. Other technical personnel for Federal, State, private, and local agencies will also find the guide useful as a basic reference when providing technical assistance relating to planning, designing, evaluating, and managing irrigation systems. College and university instructors will also find the guide useful as a classroom reference.

In addition to the irrigation Guide (part 652), chapters in the National Engineering Handbook irrigation section (now part 623) describe:

- Soil-plant relationships and soil water properties that affect movement, retention, and release of water in soil
- Irrigation water requirements
- Planning farm irrigation systems
- Measurement of irrigation water
- Design of pumping plants
- Design criteria and design procedures for surface, sprinkler, and micro irrigation methods and the variety of systems for each method that can be adaptable to meet local crop, water, and site conditions and irrigation concerns

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# Acknowledgments

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Part 652, Irrigation Guide, is an addition to the National Engineering Handbook series. The document was initially prepared by **Elwin A. Ross**, irrigation engineer, NRCS, Engineering Division, Washington, DC, (retired) with primary input and review from **Leland A. Hardy**, irrigation engineer, Midwest National Technical Center, NRCS, Lincoln, Nebraska, (retired).

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