
**Agricultural irrigation equipment —
Guideline on the implementation of
pressurized irrigation systems —**

**Part 1:
General principles of irrigation**

*Matériel agricole d'irrigation — Lignes directrices relatives à la mise
en œuvre des systèmes d'irrigation sous pression —*

Partie 1: Principes généraux d'irrigation



This document is a preview generated by EUS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Water management	1
4.1 Soil-water relationship.....	1
4.1.1 General.....	1
4.1.2 Solid particles and porosity.....	1
4.1.3 Soil water.....	2
4.1.4 Determination of amount of water in a soil layer.....	3
4.1.5 Water retention in soils.....	3
4.1.6 Soil water potential and movement of water in the soil.....	4
4.1.7 Water distribution in the soil.....	5
4.1.8 Distribution of salts in the irrigated volume.....	11
4.1.9 Salt concentration as a function of soil water content.....	16
4.1.10 Nutrients distribution.....	16
4.1.11 Root distribution.....	17
4.2 Water sources.....	17
4.2.1 Sources.....	17
4.2.2 Effects on soil and crops main parameters in relation to chemical/ biological quality of the irrigation water.....	17
4.2.3 Effects on filters and irrigation emitters in relation to chemical and physical parameters.....	18
4.3 Water distribution network: main, sub-main, distribution pipes.....	18
5 Pressurized irrigation design	19
5.1 General.....	19
5.2 Data collection.....	19
5.2.1 Soil characteristics.....	19
5.2.2 Surface topography.....	19
5.2.3 Climate.....	19
5.2.4 Water source and quality.....	19
5.2.5 Crops characteristics (orchards, field crops, vegetables).....	19
5.2.6 Local water use regulations.....	19
6 Calculating irrigation scheduling	19
6.1 General.....	19
6.2 Soil — Water reservoir.....	19
6.2.1 General.....	19
6.2.2 Calculation of water available for the crop in the root zone.....	20
6.2.3 Calculation of the management allowable deficit.....	20
6.2.4 Net irrigation depth (NID).....	20
6.2.5 Gross irrigation depth (GID).....	20
6.2.6 Leaching.....	21
6.3 Crop water requirements.....	21
6.4 Irrigation interval.....	22
Annex A (informative) Example of soil data	23
Annex B (informative) Methods for the determination of the wetted volume (bulb) dimensions	24
Annex C (informative) Salt tolerance of selected crops	27
Bibliography	28

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 18, *Irrigation and drainage equipment and systems*.

A list of all parts in the ISO 24120 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Agricultural irrigation equipment — Guideline on the implementation of pressurized irrigation systems —

Part 1: General principles of irrigation

1 Scope

This document provides a guideline for the implementation of pressurized irrigation systems.

It is applicable to small-scale family agriculture and large-scale commercial agriculture, in open fields or within enclosed growing structures (e.g. greenhouse, net house).

This document is intended for the use of agriculture ministries, agronomists, irrigation planners, farmers and end-users.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

wetting front

boundary between the wetted region and the drier region of soil during infiltration

[SOURCE: Glossary of Soil Science terms, modified — 'dry' substituted with 'drier']

4 Water management

4.1 Soil-water relationship

4.1.1 General

The soil is a three-phase system (mineral and organic solid particles, water and air). It is a reservoir of water used by plants. To design an irrigation system, the soil-water-plant relations, as described in [Clause 4](#), should be considered. Examples of values of soil physical parameters are presented in [Annex A](#).

4.1.2 Solid particles and porosity

The soil volume is made up of solid particles of different sizes (sand, silt and clay) and pores. The relative content of the three groups of particles defines the soil texture.