

Irrigation Evaluation Code of Practice

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**NOTE: This Code is paired with the
Code of Practice for Irrigation Design.**

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Irrigation Evaluation Code of Practice

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1 Introduction

1.1 Introducing the Code of Practice for Irrigation Evaluation

Low irrigation efficiency has negative impacts on farm profitability, economic prosperity and the environment. Poorly performing (non-uniform) irrigation systems and poor scheduling have been identified as the major causes of low efficiency and subsequent waste of water and energy.

Without tools to assess actual system performance, irrigators and other stakeholders are not able to determine or benchmark performance. The Code of Practice for Irrigation Evaluation provides nationally recognised and widely accepted guidelines that can be used to demonstrate and improve the efficiency of irrigation.

Adoption of this Code will enable cost effective, defensible assessments of irrigation systems and scheduling performance, and provide recommendations for improvement. This will directly benefit irrigators, the environment and the community.

The Code of Practice for Irrigation Evaluation was prepared by Page Bloomer Associates Ltd under Sustainable Farming Fund Project 02-051. Development was jointly funded by the Sustainable Farming Fund, Hawke's Bay Regional Council, Pipfruit New Zealand, Environment Canterbury, the Foundation for Arable Research and the Vegetable Growers' Federation Process Sector.

1.1.1 Why a code was developed

The Code of Practice for Irrigation Evaluation was developed to provide guidelines for irrigators and others undertaking evaluations of irrigation systems in the field. It makes recommendations for planning and conducting evaluations and reporting on the performance of irrigation systems and their management. Its focus is on key performance indicators established in the Code of Practice for Irrigation Design 2004 (draft).

The Code has been developed with reference to international practices and standards, including the draft NZ Code of Practice for Irrigation Design. The main aim of the guidelines is to encourage adoption of standardised evaluation practices that are cost-effective, recommendation driven and encourage more efficient use of irrigation resources. Its adoption will provide irrigators, regulators and other stakeholders with confidence that findings are valid, repeatable and comparable.

The Code of Practice for Irrigation Evaluation is designed to guide irrigation system and management evaluations that recognise the unique character of individual farms, their irrigation requirements and constraints, yet provide for valid comparisons and allow benchmarking of performance.

This approach is based on that developed by the Irrigation Training and Research Center (ITRC), California Polytechnic State University, California, and various ISO and ASAE Standards.

1.1.2 The reason for having a code

Irrigation is beneficial to agriculture, to the economy and to our communities. To maximise the benefits of irrigation, water application must be made correctly with an understanding of what is taking place. Good irrigation system performance and good management of those systems are fundamental to efficient use of a strictly limited resource.

As the largest user of water in New Zealand, the irrigation industry understands that it has an obligation to manage water in a responsible manner and to recognise the rights of other users. This code will assist irrigators to ensure and demonstrate that the impact of their irrigation activities on the environment is minimised.

Evaluating irrigation systems and their management is a way for members of the irrigation industry to demonstrate their responsible attitude towards land and water resources, and to show that their practice matches or exceeds accepted community values. Evaluations are valuable additions to environmental quality assurance systems which are essential if export and local market access is to be maintained.

With irrigation accounting for 70% of all water used in New Zealand, and contributing an estimated \$920 million dollars to GDP in 2002/03 (Doak et al 2004), the Code makes a significant contribution to sustainable management practices throughout the country.

1.1.3 Legitimacy

1.1.3.1 Are these guidelines compulsory?

This Code is not a regulation. It recognises the right of individuals to make their own business decisions, provided these decisions comply with legal requirements, regulations and industry standards. These decisions should also comply with principles of preserving natural resources.

On the other hand it is recommended that irrigation evaluators and other stakeholders take this Code into account, because following these guidelines will provide confidence to irrigators, other evaluators, regulators and stakeholders that the findings are valid and comparable.

1.1.4 Authorities overseeing the code

1.1.4.1 Code of Practice for Irrigation Evaluation

This Code is overseen by Irrigation New Zealand Inc. Unless otherwise stated, guidelines presented in this Code are the responsibility of Irrigation New Zealand Inc.

1.1.4.2 Technical Standards and Guidelines

Standards and guidelines from other Codes of Practice that are referenced within the Code are overseen by the relevant issuing authority.

1.1.5 Certification

There are two parallel and complementary certification programmes referenced by this Code.

The National Certificate in Irrigation Evaluation is registered on the National Qualifications Framework of the New Zealand Qualifications Authority (NZQA) through the Agricultural Industry Training Organisation.

The Certified Agricultural Irrigation Evaluator programme is run under the auspices of Irrigation New Zealand Inc.

1.1.6 Consultation Process

Organisations and stakeholders consulted in the preparation of this Code of Practice include:

- Irrigation New Zealand
- Pipfruit NZ Inc
- NZ Vegetable & Potato Growers' Fed
- Foundation for Arable Research
- Hawke's Bay Regional Council
- Environment Canterbury
- Hydro-Services Ltd.
- Winegrowers of New Zealand
- New Zealand Turf Institute
- Dairy Insight
- Lincoln Environmental
- Zespri
- Water Dynamics
- Water Control Solutions
- MAF Policy

1.1.7 What is in the code

1.1.7.1 Part 1 Introduction

This code is a written statement of the minimum desirable practices and actions to undertake when conducting irrigation system evaluations in the field for the purpose of improving performance. The code presents practices of an acceptable standard, given the current state of knowledge.

1.1.7.2 Part 2 Conducting evaluations

Part Two of the Code outlines procedures for conducting efficient and reliable irrigation evaluations, and addresses skills and qualifications for irrigation system evaluators.

Those undertaking system evaluations according to the guidelines outlined in this Code of Practice and associated Standards must have the skills and knowledge of their application. The clients of those conducting evaluations require evidence of competence, and surety that the evaluation has been conducted in a way that is fair and representative, by a practitioner with appropriate skills and integrity.

The base training and certification programme is the National Certificate in Irrigation Evaluation. This is run under the auspices of the New Zealand Qualifications Authority (NZQA) through the Agricultural Industry Training Organisation. A professional Practising Certification programme is being developed by the Irrigation New Zealand Inc.

1.1.7.3 Parts 3 and 4 Technical Schedules

Parts Three and Four of the Code present a series of Schedules for Irrigation Evaluation.

To ensure results obtained by one evaluator are valid and are comparable to those of another, standard procedures and assessments have been developed. These schedules are the components that form the basis of any irrigation evaluation completed as prescribed in this Code.

Schedule 3.1 relates to determinations of irrigation efficiency, assessed in terms of seasonal application efficiency, potential soil moisture deficit and deep percolation resulting from irrigation.

Schedules 4.1 – 4.7 outline procedures for on-site evaluation of system performance. Covering a range of pressurised irrigation types, the main purposes of these evaluations are: to determine actual application rates, to determine 'global' irrigation system distribution uniformity, and to identify the causes and relative importance of various factors contributing to non-uniformity.

System types covered include drip-micro irrigation, solid set, spraylines, multiple lateral spraylines, travelling irrigators, linear move and centre pivot irrigators. Surface irrigation methods, such as furrow or border dyke systems, are not presently covered by this Code.

1.1.7.4 Part 5 Appendices

Part Five of the Code is the Appendices. These contain selected reference material including definitions, formulae, equipment, and measurement specifications.

A series of templates are provided for use when conducting on-farm irrigation evaluations. These templates are designed to interface with prepared software that performs required calculations and generates standard reports.

1.1.8 What is not in the Code

This code applies only to evaluations of pressurised systems, performed on-site under prevailing conditions. These should reflect typical operating conditions for that system under the current management regime. The level of implicit statistical error resulting from selected methodologies must be noted. No evaluation result can be claimed to have an error of less than $\pm 5\%$. In some cases it may be significantly larger.

The Code does not cover laboratory testing undertaken to validate the design or construction of a particular make or model of irrigation machine. It does not apply to assessments of irrigation equipment for the purposes of supplying generic design information. Those activities should be guided by the relevant existing standards such as those prepared and published by the International Organisation for Standardisation.

1.2 Acknowledgements

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