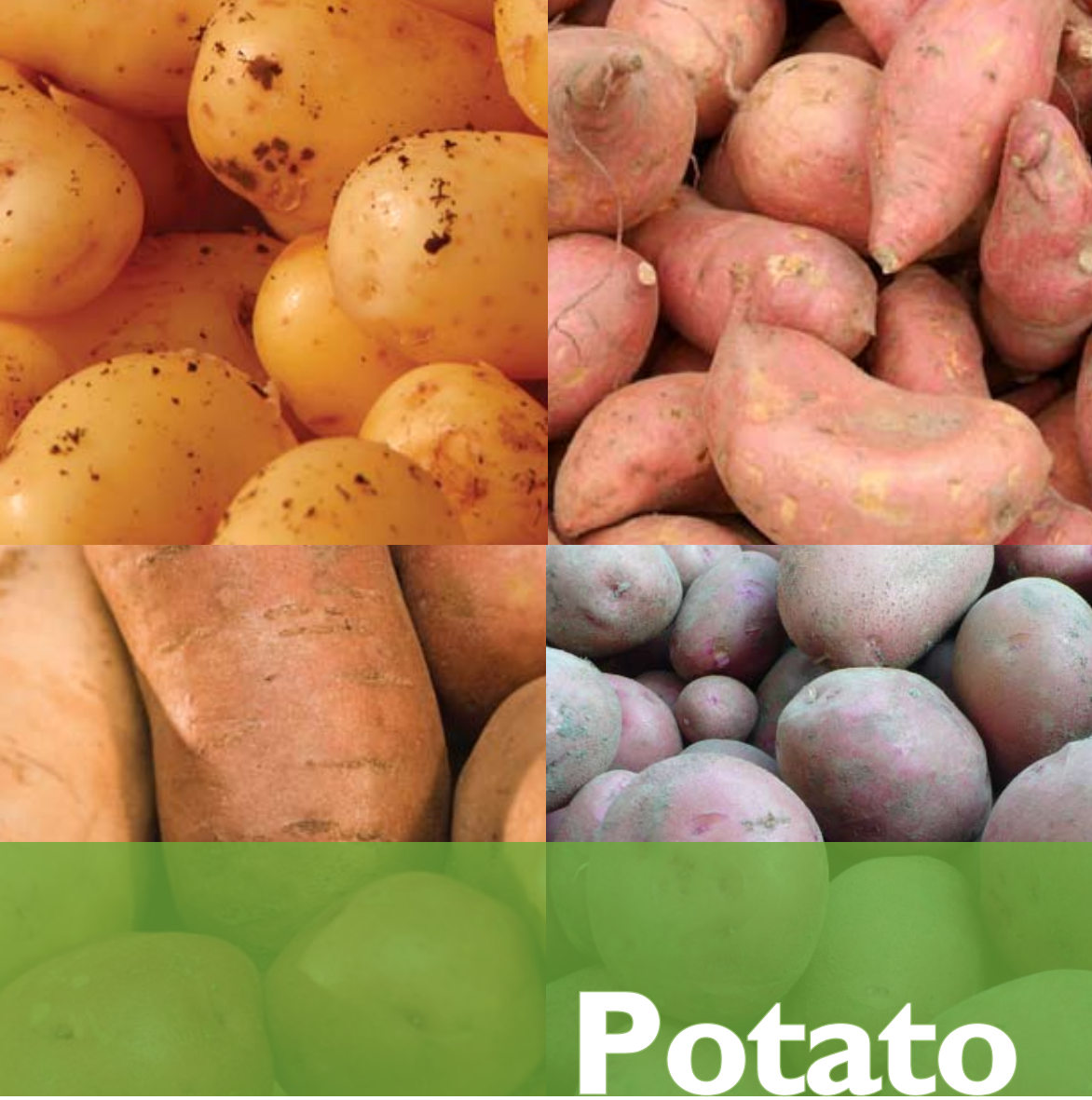


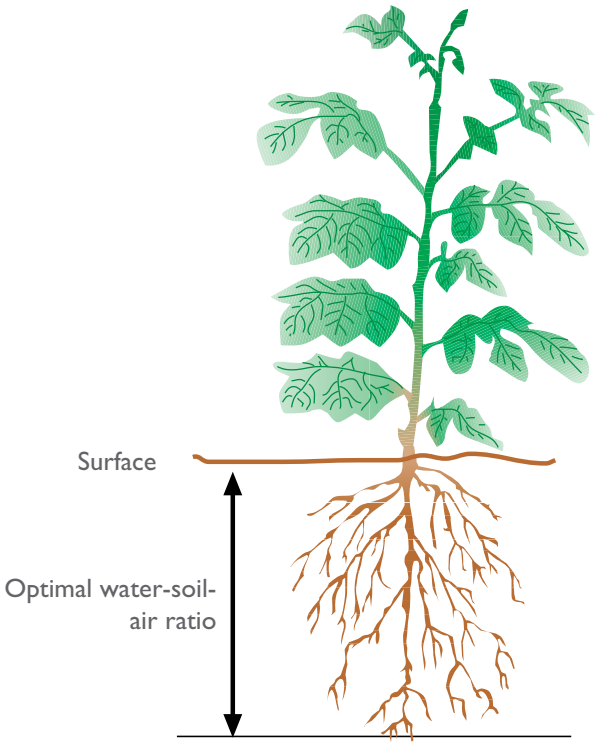
# Potato

NAANDANJAIN

A JAIN IRRIGATION COMPANY

## IMPORTANT FACTS ABOUT THE POTATO:

- An important staple food in most countries. It is one of the twelve main crops and has the sixth largest production scope in tons.
- Potato production is divided into three main categories: domestic consumption, industry and seeds.
- The modern market demands a high level of quality and wide range of shape, size, color, and
- density.
- The main production markets are Eastern Europe, China, the United States and India.
- Potato is an annual plant with a shallow root system of about 30-40 cm. Crops are grown successfully in fertile and well-drained soils. The highest yields are obtained in medium soils.
- The potato is sensitive to moisture conditions and soil temperature, and the leaves are sensitive to frost.
- The potato responds well to fertilization and fertile soil. In soils with inadequate phosphorus and potassium, a high level of fertilization is required before sowing, and a steady supply of nitrogen is required throughout the growing season.
- Potato can be grown in two seasons, depending on the climatic conditions.



## IRRIGATION

Irrigation is one of the most important factors contributing to the success and quality of the potato yield and tolerance to disease.

Annual water consumption is estimated at 4,000-7,000 $m^3$/ha. Short irrigation intervals of 3-5 days maintain soil moisture tension below 30 centibar to prevent stress.

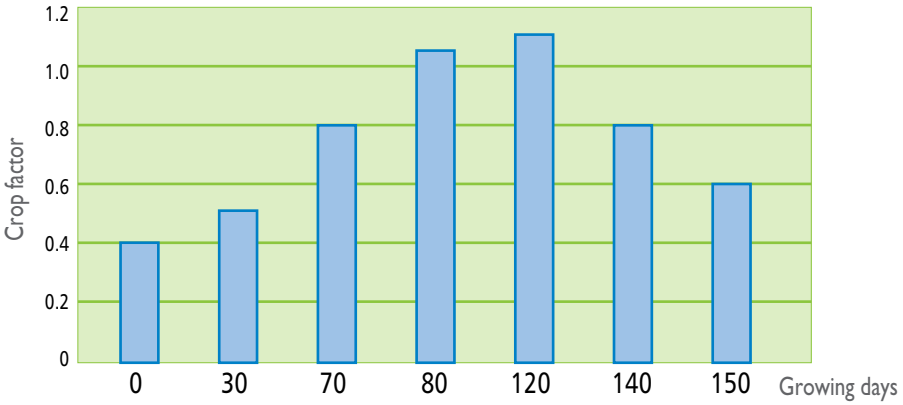
## IRRIGATION SCHEDULING VS. PLANT DEVELOPMENT (IN DAYS)

| Development stage | Sowing to emergence | Emergence to 50% canopy cover | Full canopy cover, tuber filling, up to 20 days before desiccation | From final growing stage to desiccation | After desiccation to tuber skin maturity |
|---|---|---|---|---|---|
| Irrigation intervals (days) | Maintaining soil moisture according to climate | | | | |
| Light soil | | 3-5 | 3-4 | 3-4 | 1-2 |
| Heavy soil | | 5-7 | 4-5 | 4-5 | 1-2 |
| ET * factor | | 0.6-0.8 | 1.0-1.1 (heavy soil 1.0) | 0.8-0.9 | Technical light irrigation for cooling and moisture |

* ET = evapotranspiration

## POTATO

## CROP COEFFICIENT VS. DEVELOPMENT STAGE




The crop factor multiplied by the daily ET represents the plant's water requirements.

## NAANDANJAIN IRRIGATION SYSTEMS

NaanDanJain offers two main systems for optimum irrigation of potatoes: IrriStand and Amirit. These two systems are designed to provide a comprehensive solution for efficient management of all modern potato crops, in all crop development stages.

### What is the IrriStand system?

The IrriStand system for potatoes is a low-flow sprinkler that simulates light rain. The IrriStand is based on a flexible in-and-out solid-set PE system, and is specifically designed to successfully meet potato development stages and requirements:

- Germination
- Uniform irrigation (while maintaining soil aeration conditions)
- Continuous application of nitrogen
- Micro-climate and soil cooling
- Maintaining bed structure (prevents soil erosion and cracking)
- Frost protection

### Why IrriStand?

**Main advantages**

- Low precipitation rate
- High efficiency and uniform water distribution
- Full control over wetted profile
- Availability of optimal moisture and nutrients for the root system
- Increase of crop production up to 40-70 ton/ha, according to varieties and season

IrriStand laying operation

High distribution uniformity and low application rate, at frequent irrigation cycles, provide maximum control and monitoring of the wetted and aerated soil profile, which is essential for the shallow root system.

- **Low application rate (3-5 mm/h):** allows optimal absorption of water into the soil, no run-off even on slopes.
- **Low droplet impact:** preserves soil structure and prevents crust formation to allow perfect germination and development
- **Short irrigation cycles:** prevents stress caused by water surplus; provides optimal growing conditions with highly accessible water and nutrients in a controlled wetted and aerated soil profile; no nitrate leaches below the root zone and leakage into the groundwater.


## AMIRIT SYSTEM

Based on the IrriStand concept, the Amirit is a solid-set system including 50 mm PE pipes with 10-12 meter segments.

Main advantages: flexibility, portability and easy operation.



## 1/2“ SPRINKLERS FOR IRRISTAND AND AMIRIT

### Super10

Compact ball-driven sealed mechanism for spacing up to 12 m
Available with flow regulator

### 5022 SD-U

Impact sprinkler for spacing up to 12 m
Reliable at low-pressure conditions
Available with flow regulator

### 5022 SD

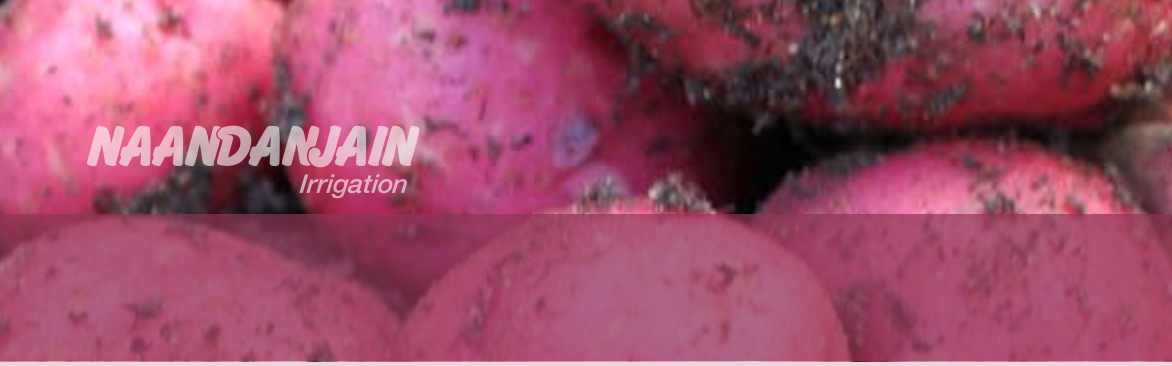
Impact sprinkler with single nozzle concept and unique SD hammer for spacing up to 14 m
Reliable at low-pressure conditions

### 6025 SD

Impact sprinkler with single nozzle concept and unique SD hammer for spacing up to 16 m.
Reliable at low-pressure conditions.
Improved resistance to wind.

### LPD for IrriStand (IrriStand Leakage Prevention Device)

Prevents drainage from the irrigation system.
Maintains a full irrigation system and ensures uniform irrigation in each area at a given time.
Prevents destruction of crop rows.


## FROST PROTECTION

The IrriStand and Amirit can be used efficiently as a frost protection system.

**Features:**

- Low precipitation
- High uniformity
- Optimal sprinkler rotation speed
- Cost-effective (IrriStand or Amirit systems cover a large area using relatively small pumps).

For large fields with a small pump capacity, an early light irrigation will warm the air above the immediate surface, raising the temperature by 1°C. This is an important factor for emerged potatoes.

## PESTS AND DISEASE CONTROL

Improved management and quality control with IrriStand controlled irrigation

| | Treatment | IrriStand contribution |
|---|---|---|
| **Common Scab** | *Moisture on the tuber surface prevents infection by the bacteria. Trials show how irrigation can be used to control the disease | Irrigation scheduling with IrriStand maintains optimal moisture around the potato tubers |
| **Blackleg (Erwinia)** | * Avoid excessive watering and run off Irrigation scheduling and balanced quantity reduces risk. | No run-off |
| **Stem canker (Rhizoctonia)** | *Caused by drought stress Proper irrigation helps the crop overcome the worst effects. | Manejo controlado de los intervalos apropiados del riego |
| **Tuber dry matter** | Crisping and chipping industries require potato with high dry matter. A well-managed irrigation system does not reduce the quality and even contributes in certain varieties. | High dry matter and quality potatoes |
| **Doll's formation and cracking** | Well managed irrigation scheduling ensures smooth round potatoes | Smooth round potatoes and uniform color |

* Irrigated crops and their management/Roger Bailey


## AGRO-TECHNICAL CONSIDERATIONS

**Pesticide control**
The IrriStand solid-set system enables complete flexibility of irrigation timing and spraying.
In some cases, the sprinkler system can be used for chemigation.

**Soil temperature**
Tuber quality is affected by soil temperature.
Light irrigation helps to cool the soil surface.

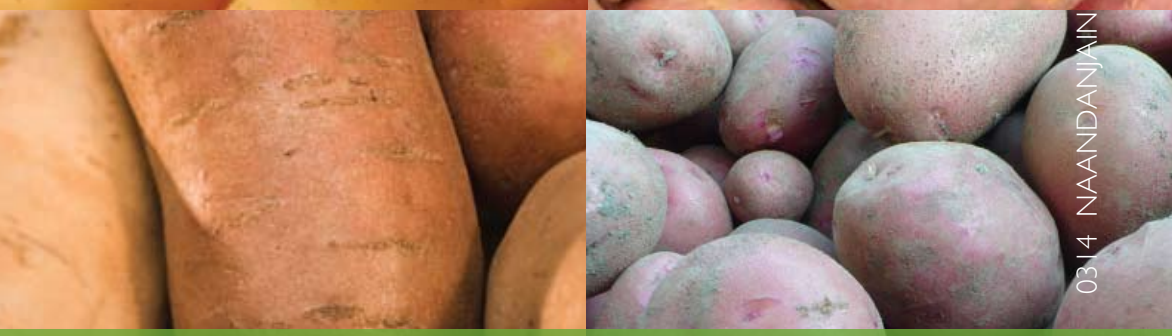
**Fertigation**
The high water distribution uniformity of the IrriStand system ensures accurate application of fertilizers to each square meter in the field.

**Hilling**
The low precipitation rate of the IrriStand prevents the need for additional tillage and eliminates the need to rebuild eroded beds

## SYSTEM COMPARISON

IrriStand system vs. traveler gun sprinkler and traditional sprinkler system

| | Irristand & Amirit | Standard sprinkler/ traveler irrigator | Irristand advantages |
|---|---|---|---|
| **Uniformity of distribution (cu%)** | 90% | 75 - 85% | |
| **Efficiency (ratio of water pumped to water reaching the roots)** | 85 - 90% Closed system no leak, large irrigated block, reduced wind effect, no run-off | 75% | 600-900 $m^3$/ha |
| **Yield** | 120 - 130% | 100% | +9000 kg/ha depends on variety and local conditions |
| **Potato quality and uniformity** | Highest results in color, shape, and density | Average | Maximal market price |
| **Labor used during the season** | 1 person 1 hr/day for small or large area up to 200 ha | Gun sprinkler-50 ha-3.0 hr/day | |
| **Fertilizer use (K, N)** | 100% | 130% | 200-300 kg/ha (in nitrate fertilizer) |
| **Energy** | 100% | 140-150% | 40% - 50% (in fuel) |



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The NaanDanJain IrriStand system has revolutionized the traditional sprinkler market. Potato growers will achieve immediate benefit from the system. Contact your dealer or our office for further information.



All information should be used only as a guideline. For specific recommendations contact your local agronomist.

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