

Potato

Drip irrigation and fertigation protocol



INTRODUCTION

Global adoption of drip irrigation for potato is becoming more widespread. The ability to ensure yield and quality, as well as to overcome growing obstacles such as uniformity, long dry periods, water salinity, fungi stress, and more, is pushing more growers and stakeholders toward drip as a solution. Thus, the need to supply growers with the relevant protocol for their irrigation & fertigation practices is timely.

SOLUTIONS

Drip laydown at the field can be done in 2 different configurations



1 lateral per ridge (at the center) 1:1

USE CASES FOR 1:1

- fresh consumption and processing potato
- High to premium quality
- Low to zero rainfall
- Light to heavy soils
- When high uniformity is required



1 lateral per 2 ridges configuration (1:2)

USE CASES FOR 2:1

- Seed potato
- Processing and starch
- Occasional rainfall during growth season
- Medium to heavy soils
- Low-medium quality fresh market

GERMINATION

High soil moisture scenario: If the field reaches field capacity and a full wet profile during the winter, you can germinate and establish the crop with no need for irrigation before tuber initiation stage. This is true if all tillage is done during autumn, since spring tillage can dry out the soil.

Low soil moisture scenario: Proper germination and establishment of the crop can be achieved only in a fully wet soil profile. If rains are scarce prior to planting and the soil profile is not wet, pre-season irrigations are required to fill the soil profile and maintain hydraulic conductivity of the soil.

Germination irrigation can be done easily by drip irrigation with 1:1 configuration or 1:2 in medium to heavy soils

ESTIMATED SOIL MOISTURE VS. PRECIPITATION QUANTITIES BETWEEN CROP CYCLES

The table below provides a rule of thumb regarding expected soil moisture as a result of rain. Post harvest and prior to next-season planting, it is advisable to monitor rain quantities to establish whether the water content of the soil has been replenished.

HOW TO CHECK YOU HAVE A WET PROFILE

Rain measurement: Measure rain quantities between growing seasons. After autumn tillage, start measuring rain quantities. One month prior to planting, check your total precipitation quantity and follow the steps found in the table below. Don't wait for planting day!

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		PRECIPITATION (mm)		
SOIL CATEGORY	SANDY	0 - 200	200 - 300	> 300
	HEAVY	0 - 300	300 - 450	> 450
SOIL MOISTURE		Extreme deficit	Deficit quantity	Adequate quantity
REQUIRED ACTION		Requires supplementary overhead irrigation, due to extremely dry and cracked soil	Pre-irrigation by drip to overcome deficit	In most cases, no need for pre-planting irrigation

DRIP LAYDOWN AND RECOIL TIME

1:1

Lay down

2 to 3 weeks from seeding

Recoil

Prior to harvest

1:2

Lay down

- 2 weeks from emergence in dry climate
- 4 weeks from emergence in humid climate if the soil is wet

Recoil

After irrigation season has ended, within 3 to 4 weeks prior to harvest

PLANT IRRIGATION GUIDELINES

POTATO – MEDIUM CYCLE (120 DAYS FROM EMERGENCE)

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Stage name	Seeding to emergence	Sprout development	Vegetative growth	Tuber initiation	Tuber Bulking	Tuber Maturation
Graphic presentation						
Kc	0	0.5	0.5 - 0.75	0.8 - 1.1	1.1 - 0.8	0.8 - 0.4
Soil depletion [%] (Irrigation interval)	50	30 (every 3-4 days)	30 (every 3-4 days)	20 (every 1-3 days)	20 (every 1-3 days)	30 (every 3-4 days)
	10 to 30 days	16 days	20 days	20 days	34 days	30 days

PLANT NUTRITION

Guidelines

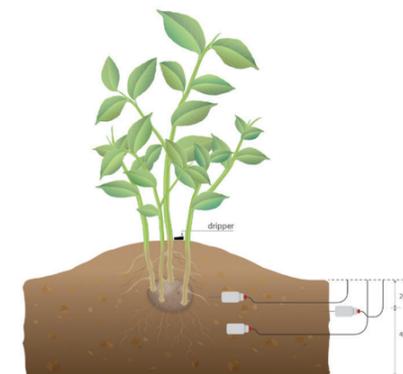
STAGE	DURATION	N	P205	K20	CAO	MGO	S	START DATE	END DATE
BASE FERTILIZATION	-	100	100	100					
SPROUT DEVELOPMENT	16	15	0	20	0	0	0	15/04	30/04
VEGETATIVE GROWTH	20	25	0	80	0	0	0	30/04	21/05
TUBER INITIATION	20	30	0	50	0	0	0	21/05	10/06
TUBER BULKING	34	30	0	50	0	0	0	10/06	14/07
TUBER MATURATION	30	0	0	0	0	0	0	14/07	13/08
SUM	120	200	100	300	0	0	0		
USER INPUTS:	TOTAL AMOUNT	200	100	300					
	BASE FERTILIZATION	100	100	100					

SOIL WATER MONITORING

2 monitoring options are available

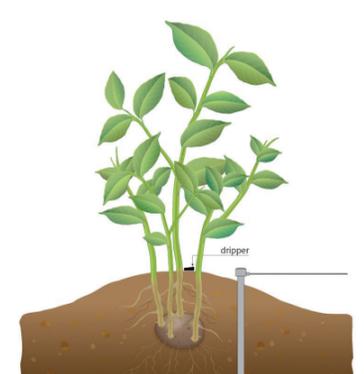
Pin Point sensor

- Make sure that the sensors are installed at the center of the ridge, in the wetted area where the active root zone is.
- Make sure that the shallow sensor is installed around 20 cm depth and the deeper installed at around 40-50 cm - at the bottom of the root zone.
- It is also recommended to use a side sensor at the side of the ridge in order to detect lateral water movement and ensure soil moisture for the lateral roots.



Profile sensor

- The profile sensor should be installed at the center of the ridge, in the wetted area where the active rootzone is.



RECOMMENDED PRODUCTS FOR GROWING POTATOES

HWD THREE DRUMS LAYOUT MACHINE



An ideal layout machine for long laterals in open fields featuring three HWD large metal drums.



HWD



INSTALLATION



ON SURFACE

TWD / MWD SHALLOW BURYING MACHINE FOR POTATOES



A TWD / MWD burying machine suitable for all sizes of potato fields. The machine is equipped with unique ridge plates that install the dripline centered and with accurate depth while maintaining the ridge shape.



TWD & MWD



INSTALLATION



SHALLOW

TWD / MWD RETRIEVAL MACHINE FOR RECYCLING



An end of row retrieval machine suitable for small to medium fields, featuring a special system that creates uniform, dense rolls of used TWD reels for recycling.



TWD & MWD



RETRIEVAL



RECYCLING

HWD METAL DRUM RETRIEVAL MACHINE FOR REUSE



An end of row retrieval machine suitable for all sizes of fields that ensures well uniformed HWD metal drums for reuse.



HWD



RETRIEVAL



REUSE

SCRENGUARD™ AUTOMATIC SCREEN FILTERS



Automatic screen filters provide perfect protection for irrigation systems thanks to extra-large filtration area. Screnguard™ also incorporate the most effective self-cleaning mechanism, saving labor, water and energy.



BIGGER



HIGH CORROSION AND UV PROTECTION



EASE OF MINTENANCE

ALPHADISC™ DISC FILTERS, LEAN & MEAN FILTRATION MACHINE



AlphaDisc™ is the ultimate irrigation system protection thanks to a combination of precise depth filtration, high dirt-holding capacity and a unique easy-to-scale modular design that covers a wide range of flow rates or water quality needs.



HIGH EFFICIENCY



HIGH DIRT-HOLDING CAPACITY



MODULAR & FLEXIBLE

STREAMLINE™ X REGEN™



Integral non pressure-compensated high clogging-resistance dripper, for single season applications. Easy to install, to retrieve and to recycle.



SUSTAINABLE



TOUGH



HIGH CLOGGING RESISTANCE



FLEXNET™ FLEXIBLE PIPES



Innovative leak free mainline and sub-mainline piping solutions that are easy to install, retrieve and relocate. Made from reinforced polypropylene with integral fittings.



FLEXIBLE



PORTABLE



LEAK FREE

D-NET™



Super durable 1/2" impact sprinkler with unique 3D arm and 24 degrees water trajectory angle, for field crops and vegetable irrigation.



VERY HIGH WATER DISTRIBUTION UNIFORMITY



ROBUST & LONG LASTING



REDUCED LABOR COST

DRIPNET™ PC



Integral compact pressure-compensated, anti-siphon mechanism dripper, for semi-permanent drip applications for growers who seek quick ROI. Ideal for field crops in complex topography and sub surface applications.



PRESSURE-COMPENSATED



ANTI-SIPHON MECHANISM



SELF-FLUSHING MECHANISM



GROW MORE WITH LESS™



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