Prospects for the Chilean potato industry

Huub Schepers, Anton Haverkort & Romke Wustman

Outline of presentation

- ✓ Potato industry in the Netherlands
- ✓ Potato industry in Chile
- ✓ Potato prospects for Chile: Adding value
- ✓ Potato processing: starting in a country
- ✓ Suggested improvements

Potato industry in the Netherlands

- ✓ Population: 16,7 million
- ✓ Average acreage: 160,000 hectares
  - – Seed potatoes: 35,000 ha – 1.2 million tons
  - – Table potatoes: 3,000 ha – 1 million tons
  - – Processing: 87,000 ha – 3,3 million tons
  - – Starch potatoes: 35,000 ha – 2 million tons
- ✓ 70-80% of potato volume is processed
  - – French Fries, chips, ready-made meals, starch
- ✓ Number of growers: 9,000

WAGENINGENUR/CHILE
KNOWLEDGE IN ACTION

Potato industry in Chile

- ✓ Population: 17 million
- ✓ Average acreage: 55,000 hectares
- ✓ Average yield: 20 tons/ha
- ✓ Average production: 1,1 million tons
- ✓ Annual potato imports: 70,000 (raw) tons
  - – Mainly (75%) Deep frozen French fries imports: EU, Canada, US
- ✓ Average consumption: 60 kg/person
  - – Chiloe island: 200 kg/person
- ✓ Number of growers: 67,000

Chile: Products and costs

- ✓ Fresh consumption: 90 %
- ✓ Niche market for Papa nativas: 500 ha
- ✓ Increasing market potential for processed product
- ✓ Current cost of production per
  - Pesos 1,240,000
  - Euro 2,000
- ✓ Current cost of production per kg (at 20 t/ha)
  - Pesos 62
  - Euro 0.10

The markets of Chilean produced potatoes

National production and utilization (study 2011)

- ✓ 61 % fresh consumption
- ✓ 15 % seed
- ✓ 6 % processing
- ✓ 4 % animal food
- ✓ 14 % lost in post-harvest phase

The markets of Chilean produced potatoes

Challenge:

- ✓ 27,000 tonnes French fries = 54,000 tons raw material
- ✓ Substitute imports deep-frozen French fries with Chilean grown potatoes

Effect of yield on production cost

yield (t.ha^{-1})	cost per kg in Pesos	cost per kg in Euro
20	62	0.10
30	41	0.07
40	31	0.05
60	21	0.03

Actual situation in Chile

- ✓ Limited local raw material for processing
  - Chips processing well organized
  - Potato salads: small scale operations
  - French fries processing poorly organized
- ✓ Limited use of modern technology in:
  - Disease (late blight) control
  - Harvesting and handling
  - Storage
- ✓ Limited use of added value opportunities
  - Washing & packing fresh potatoes incl. Papas nativas
  - Processing

Potato prospects for Chile: adding value

=

Potato prospects for Chile: adding value

Performance

Genotype

Environment

Management

Society

P = G x E x M x S

Potato prospects for Chile: adding value

P = G x E x M x S
Performance is Genotype x Environment x Management x Society

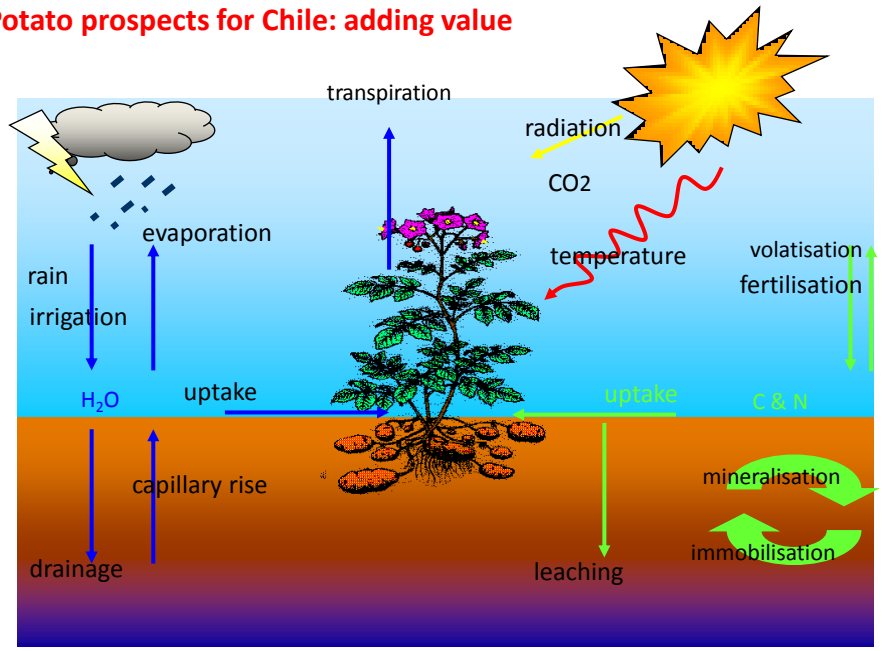
Elaboration of these elements:
Performance = kg “high end washed, graded and packed potato” per ha or “kg Ff per ha”

Environment = altitude, rainy season, dry season

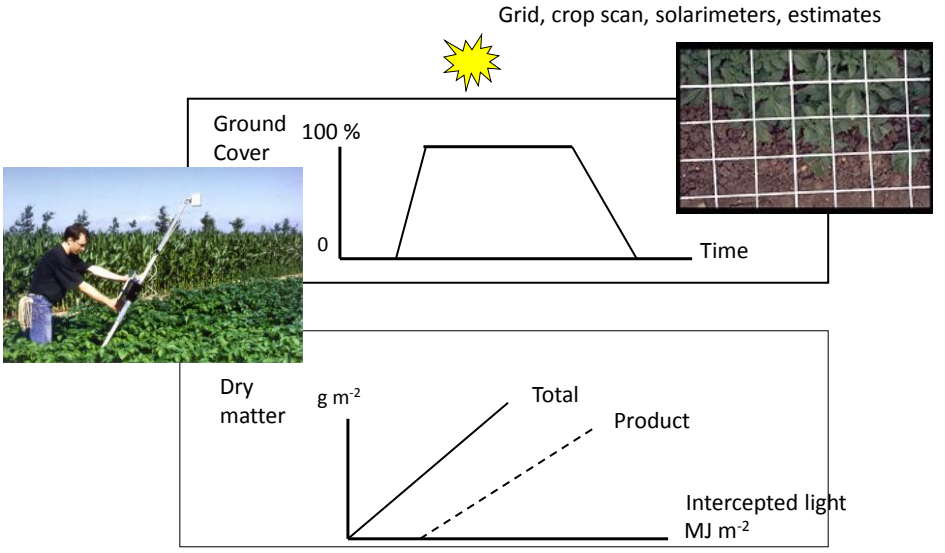
Management = soil preparation, fertilization, irrigation, crop protection, mechanization

Society = price setting (in some countries organic, non GM,…)

Potato prospects for Chile: adding value



Potato prospects for Chile: adding value



Yield levels

Potential yields:
theoretical, unobtainable
(driven by sunshine temperature)

Attainable yields:
obtainable, may not be economical
(limited by water, nutrients)

Actual yields:
growers' yields
(reduced by pests, diseases, weeds)

Potato prospects for Chile: adding value

Inputs below optimum (several surveys)

- Seed: health, age, variety

-Diseases and pests: late and early blight, viruses, brown rot, tuber moth

- Fertilization: pH, NPK, micronutrients

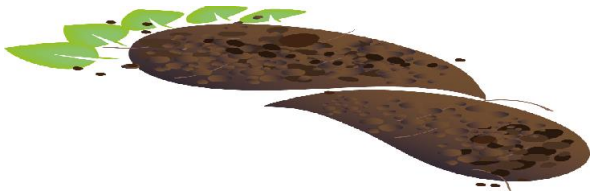
- Water supply: rain and irrigation

- Storage: losses avoidance: in field in dry cool winter, in clamps, Seed DLS

- Mechanization: traction with animals, machines

Grading, washing, sorting, peeling, cutting, blanching, drying, frying, oil removing, cooling, packing, freezing, transport, shelving ....and eat

Potato prospects for Chile: adding value

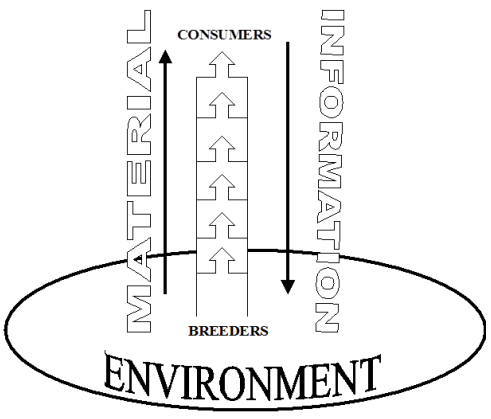


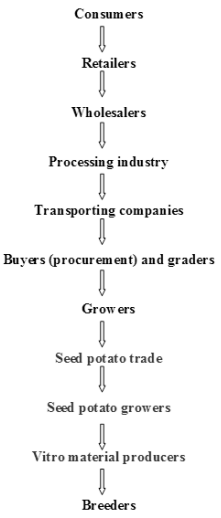
WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Potato prospects for Chile: adding value

Concluding:
- Improved resource use efficiency (= higher yields)
- Reduced losses
- Increased value through processing
- A keen eye on sustainability

Potato processing: starting in a country

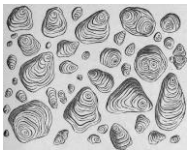


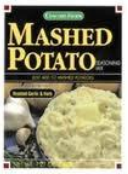


Potato processing: starting in a country

Processed products:

- Starch
- Flour/flakes
- Peeled
- Peeled and cut
- Peeled, cut, blanched
- Baby potatoes
- Frozen fries
- Crisps (chips)





Variability in processing potato

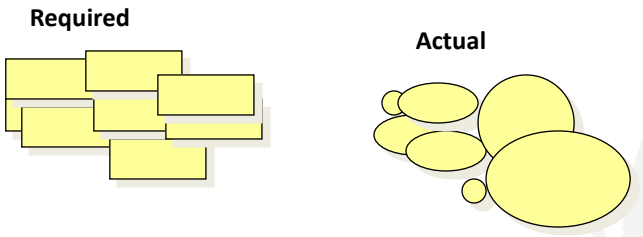
Characteristic	Influences	Desired level
Dry matter concentration	Texture, Fat uptake Recovery	20-24 %
Nitrate concentration	Acceptance certain markets	Low!
Black spot susceptibility	Blue discoloration	Minimal
Non-enzymatic discoloration	Colour of the frozen produce	Minimal
Reducing sugars	Colour of frozen and finished	< 0.5 %
Length/widt	Recovery	> 1.6

WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Variability in processing potato

Characteristics that may vary

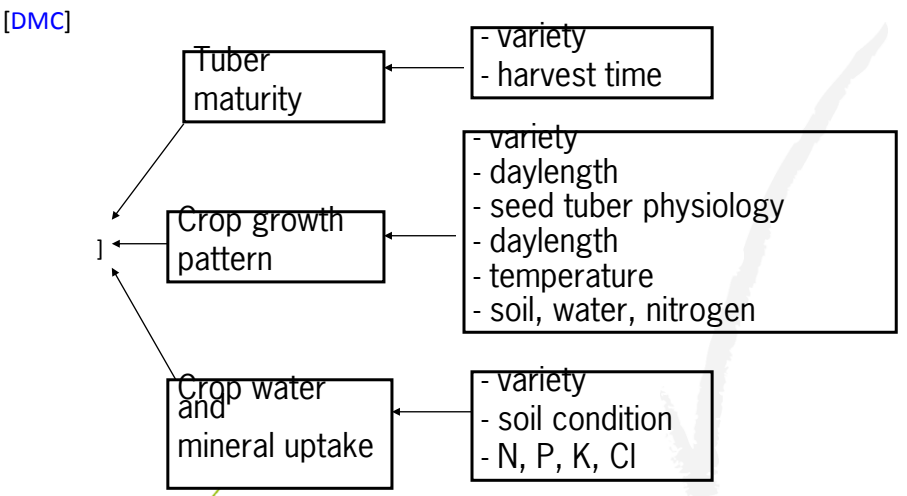
size distribution (grading)



WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Variability in processing potato

After van der Zaag, 1990)



WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Variability in potato for processing

- ✓ Causes of variation between tubers: **Management** at field level
- ✓ Causes of variation between tubers: **Environment** (between plant and spots in the field)
- ✓ Causes of variation between tubers (same stem): **Physiology**
- ✓ Causes of variation between tubers: Number of tubers (so **size distribution**!)

WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Suggested improvements

- ✓ Aim at a competitive supply chain for high end products: table, salads and processed
- ✓ Meet the specifications of the processors and retailers
- ✓ Produce potatoes at competitive prices
- ✓ Introduce modern technology for:
  - Disease control: late blight
  - Handling and storage
  - Precision farming

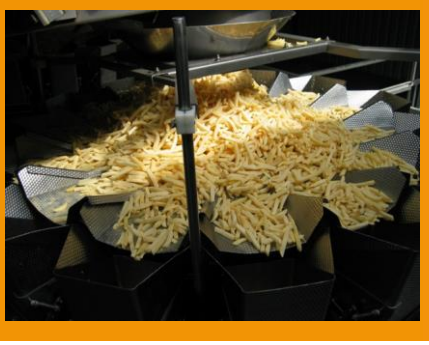
WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Suggested improvements

- ✓ Involve (i.e. Netherlands) top technology in upgrading the entire chain
- ✓ Organize growers for:
  - More intensive knowledge transfer
  - Joint purchase of inputs
  - Join forces in the supply chain: interdependency
- ✓ A National Potato Platform should play an initiating role:
  - INIA + Consorcio Papa Chile + Ministry of Agriculture

WAGENINGENUR CHILE
KNOWLEDGE IN ACTION

Thank you for your attention



Huub Schepers