The Experience of Doğa Seed on Reducing Post-Harvest Losses

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Doga Seed in brief

- ✓ Established in Nevsehir for seed and processing potato production by Yakup Karahan in 1996
- ✓ The first cave storage (10.000 t) in 1996
  - ✓ Total capacity reached to 120.000 t in 2014
  - ✓ All storages were air-conditioned in 2014
- ✓ Tissue culture laboratory and mini tuber production in 2005
  - ✓ Tissue culture laboratory re-built and uscaled in 2010
  - ✓ Two millions of mini-tubers per year
- ✓ Cultivar breeding program in 2010
  - ✓ The first candidates will be submitted in 2016
- ✓ French fry factory in 2011
  - ✓ The capacity increased from 6 t up to 18 t per hour in 2015
  - ✓ 42% of production exports to Brasil, France, The Netherlands, Russia, Azerbaijan, Saudi Arabia, Irak and Pakistan

Doga Seed in brief

- ✓ 405 employees in total
- ✓ Seed, processing and ware potato production on 2800 ha in three regions,
- ✓ Annual potato production of 120.000 t in total
- ✓ Storage of 80.000 t potatoes annually
  - ✓ 20.000 t seed potato
  - ✓ 60.000 t processing potato
- ✓ The largest single potato producer in Europe

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Kapanır - Clo

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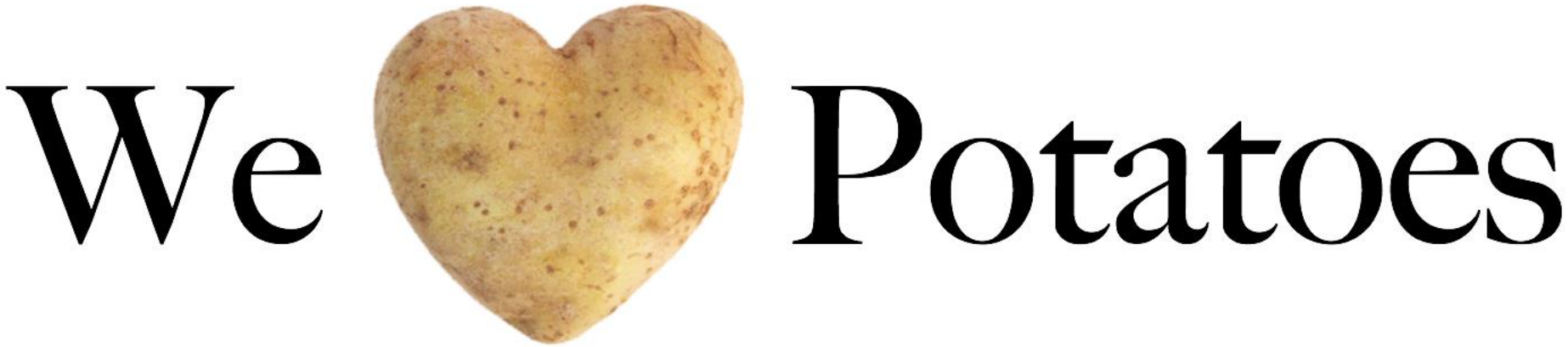
Doga Seed is a POTATO company dealing with only potatoes from seed to fork...



Potato is not only our business but also our passion...

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Hidden treasure

Post-harvest losses in potato

- ✓ Potato is a very vulnerable crop for post-harvest losses
  - ✓ Bruising
  - ✓ Weight losses
    - ✓ Loss in dry weight (Respiration)
    - ✓ Loss in fresh weight (Evaporation)
  - ✓ Quality losses
    - ✓ Starch breakdown
    - ✓ Sugar buildup
  - ✓ Decaying
  - ✓ Sprouting
  - ✓ Greening

Many efforts and inputs to increase yield

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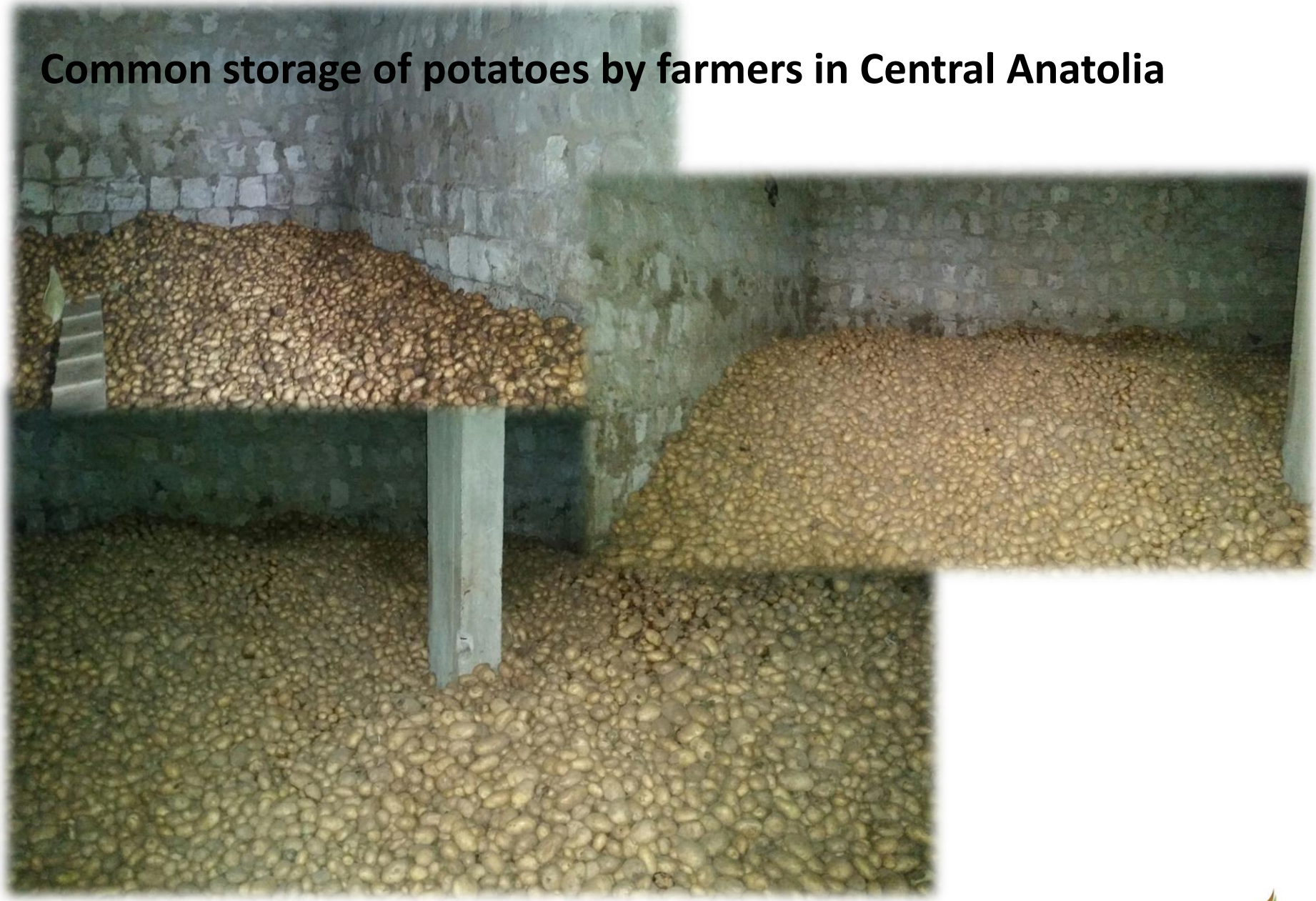
Common storage of potatoes by farmers in Central Anatolia



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Wasting potatoes due to unsuitable post-harvest management

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Post-harvest losses in potato

- ✓ Both pre- and post-harvest conditions affects losses

  - ✓ <u>Pre-harvest factors</u>
    - ✓ Cultivar and seed quality
    - ✓ Air and soil temperatures during growing period and harvest
    - ✓ Pests and diseases
    - ✓ Availability of water for irrigation
    - ✓ Soil types
    - ✓ Skin-set and damages during harvest

  - ✓ <u>Post-harvest factors</u>
    - ✓ Temperature
    - ✓ Relative humidity
    - ✓ Aeriation
    - ✓ Pest and diseases

Cappadocia region offers marvelous oppurtunities for natural potato storage

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Natural cave storages in Cappadocia

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Before modernization of Doga Seed cave stores

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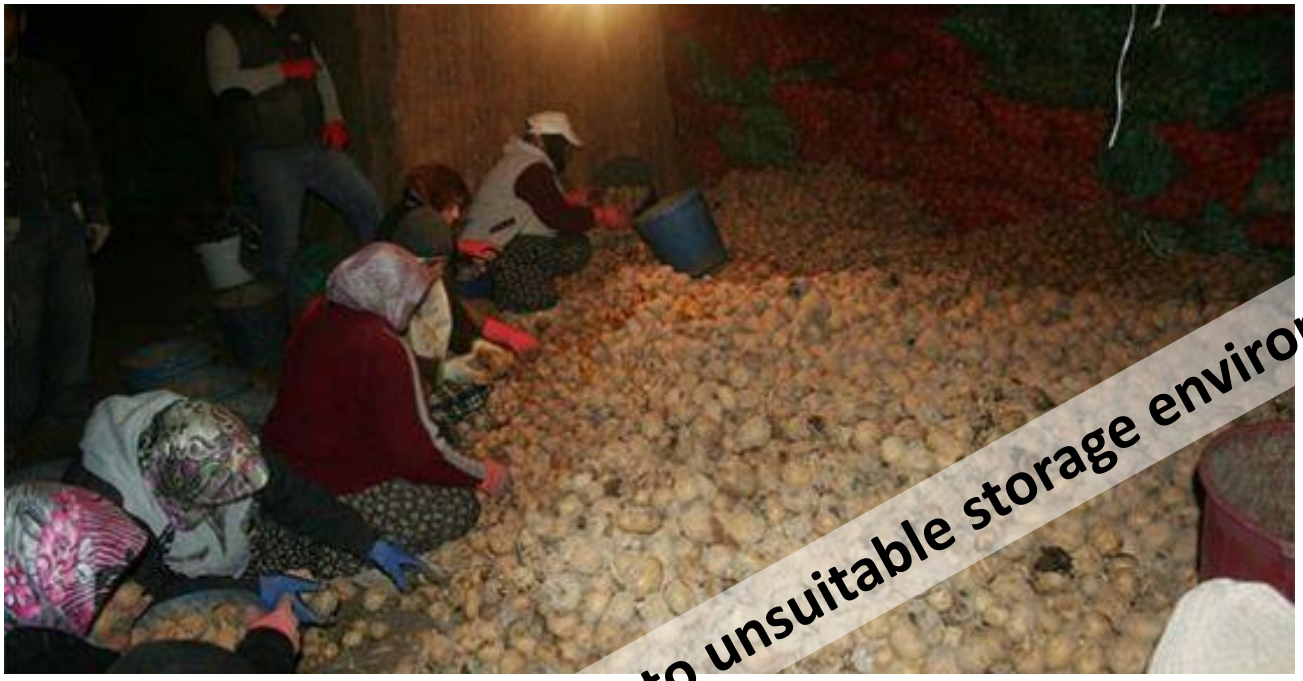

High (>20%) post-harvest losses due to unsuitable storage environment

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How Doga Seed reduced post-harvest losses?

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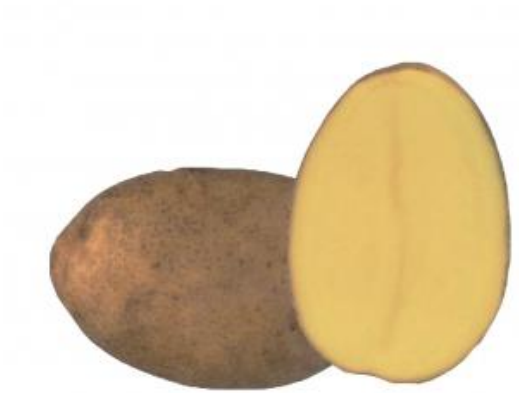
Pre-harvest precautions

- ✓ Selection of suitable fields
  - Heavy soils, stony fields results in more damage and bruising on tubers
- ✓ Better tillage and seed-bed preparation
  - Avoid tillage on wet soils to prevent clods

Pre-harvest precautions

- ✓ Selection of cultivars having better storability
- ✓ Using high quality seed tubers

Hermes
Russet Burbank



Pomqueen
Granola
Agria

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Pre-harvest precautions

✓ **Controlling pest and diseases on the field**

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Pre-harvest precautions

- ✓ Haulm killing before harvest for better skin-set
- ✓ Harvesting at proper soil and air temperatures
  - ✓ Harvesting at over 25 ^{o}C results in at least 10% more loss in storage
  - ✓ Light irrigation helps to reduce damages
- ✓ Special attention to reduce damage during harvest and picking

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✓ Rapid harvest and immediate transfer to storage

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Post-harvest precautions

- ✓ Reducing dropping height during loading to storage
- ✓ Elimination of damaged/diseased/rotten/greened tubers before storage

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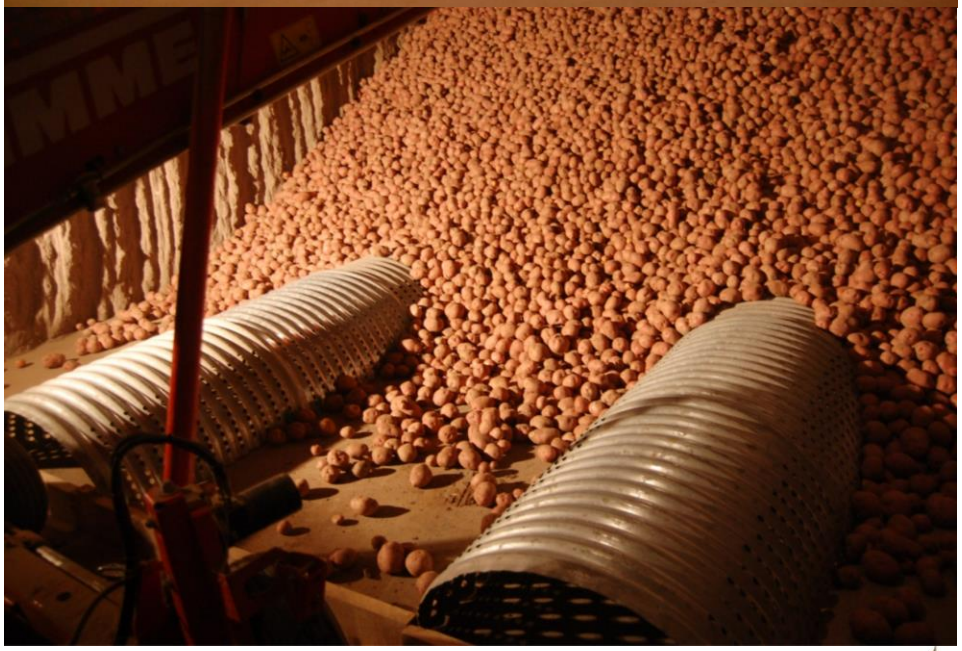
Post-harvest precautions

- ✓ Keep hygiene at maximum level in storage
- ✓ Proper curing at the beginning of storage period,
  - ✓ Keeping potatoes at 12-13 ^{o}C and 95% humidity for 15 days for suberization and skin-set
  - ✓ Then, gradually decrease (0.5 ^{o}C) in temperature until target temp
- ✓ Spraying Chlorpropham (CIPC) to prevent spraying sprouting



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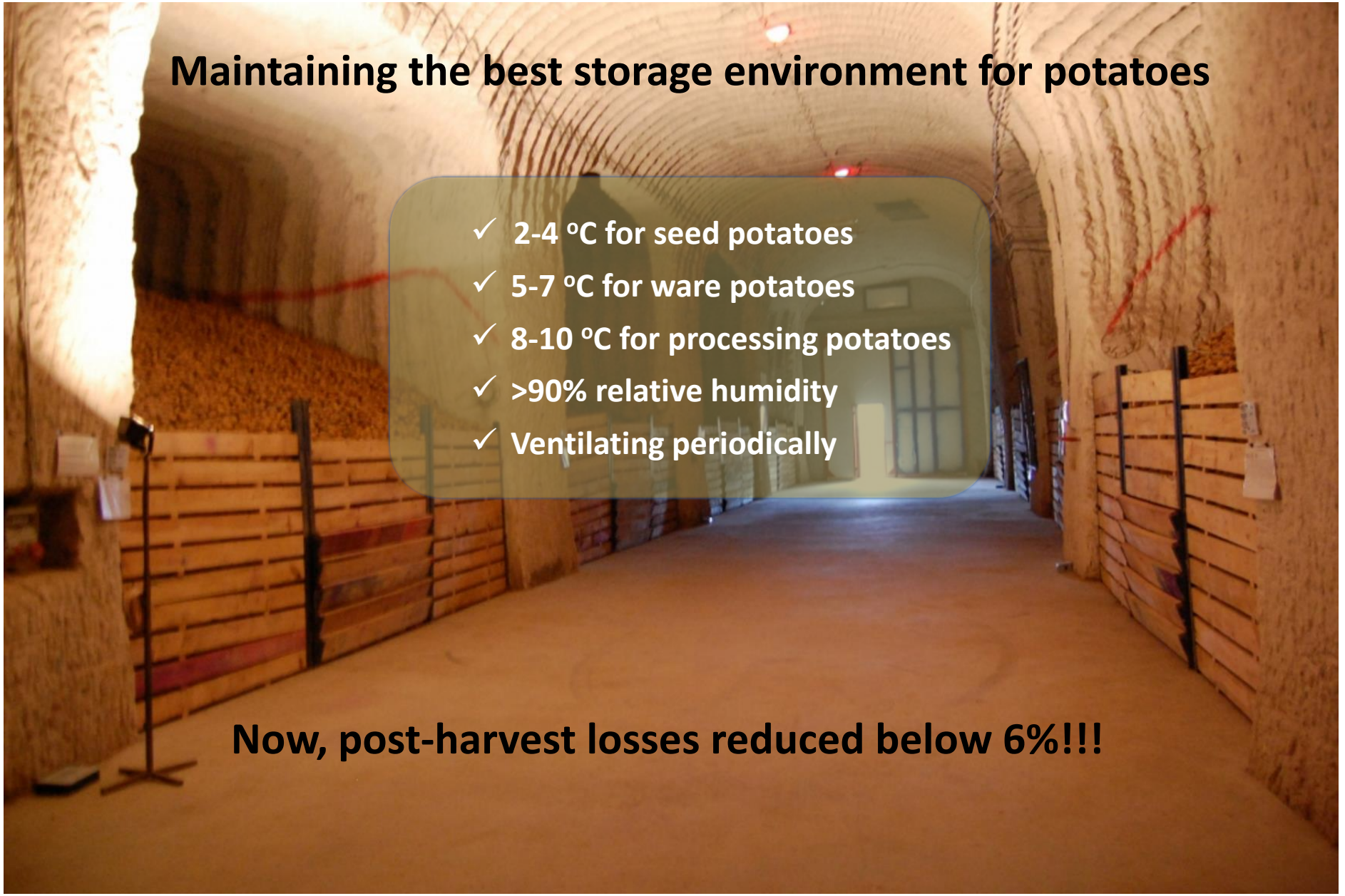
Maintaining the best storage environment for potatoes



- ✓ 2-4 °C for seed potatoes
- ✓ 5-7 °C for ware potatoes
- ✓ 8-10 °C for processing potatoes
- ✓ >90% relative humidity
- ✓ Ventilating periodically

Now, post-harvest losses reduced below 6%!!!

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Using wooden box for seed tubers

Post-harvest losses below 4% for seed potatoes!!!

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Fully automated storage for mini-tubers…

Thanks for your attention…

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