

# POTATO TRAVELS

**SOUTH AMERICA [ANDES MTN.:CHILE, COLUMBIA, PERU]**

16th C.-- mix

**MEDITERANEAN EUROPE**

17th C.-- yellow flesh

**CENTRAL EUROPE**

17-18th C.

**BRITISH ISLES - IRELAND**

mid 19th C.-- white flesh

**NORTH AMERICA**

late 20th C.

**PACIFIC RIM  
CHINA & INDIA**



# WORLD POTATO PRODUCERS

| 1988     | 1992    | 1998   | 2003    | 2008    |
|----------|---------|--------|---------|---------|
| USSR/Ukr | RUSSIA  | CHINA  | CHINA   | CHINA   |
| POLAND   | CHINA   | RUSSIA | RUSSIA  | INDIA   |
| CHINA    | POLAND  | POLAND | INDIA   | RUSSIA  |
| GERMANY  | UKRAINE | USA    | USA     | UKRAINE |
| USA      | USA     | INDIA  | UKRAINE | USA     |

Afganistan: potato production = 310,000 tons : value = 38 M\$

**Solanaceous ('Nightshade') Family  
includes potato, tomato, pepper, tobacco**

**Solanum genus = potato  
has over 2,500 species;  
250 produce tubers;  
8 are cultivated, and  
1 is commonly used in the world.**

**sp. tuberosum = common potato  
has many types based on  
skin color and internal color**



# POTATO MARKETS

SEED TUBER PRODUCTION

FRESH/TABLESTOCK

FRENCH FRY

POTATO CHIP [CRISP]

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Differences involve:

VARIETY / TYPE

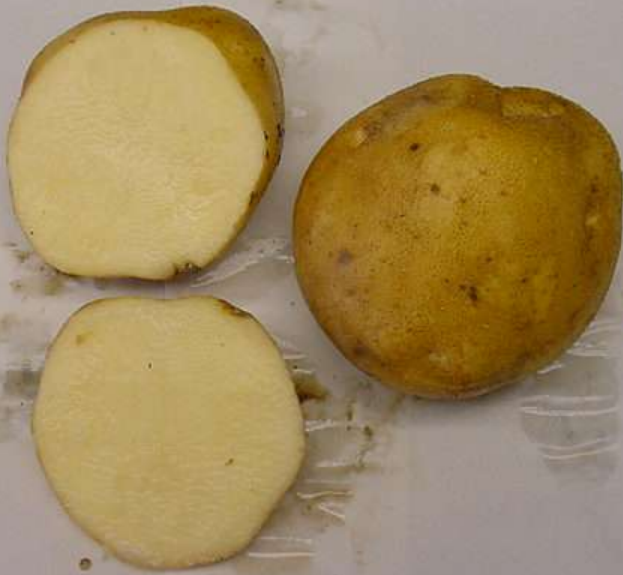
PLANT SPACING

STARCH CONTENT

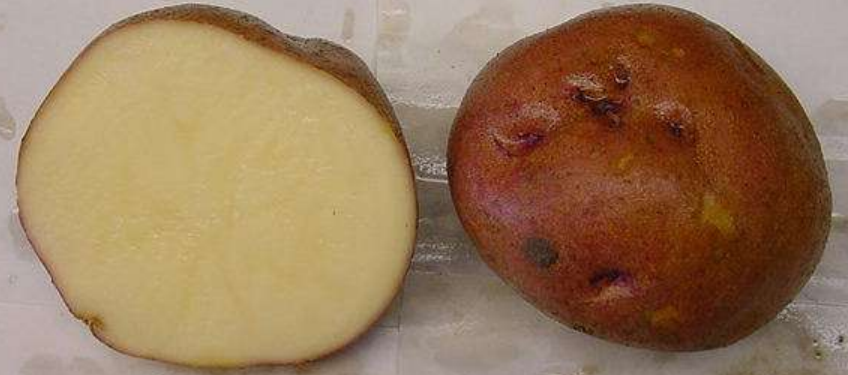
REDUCING SUGAR CONTENT



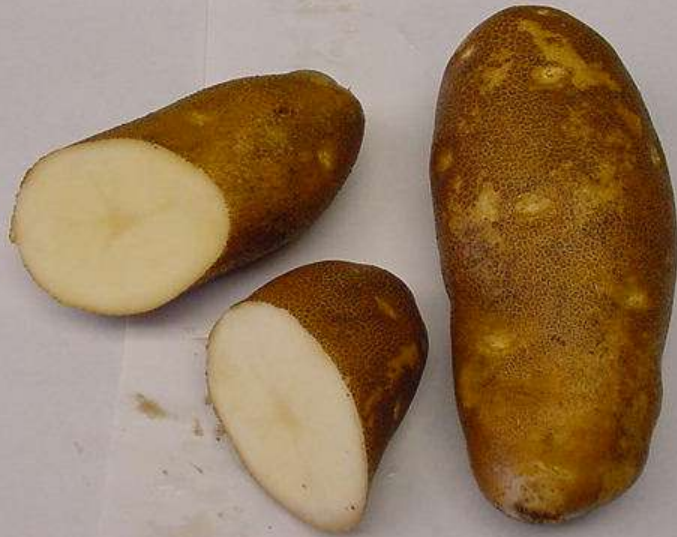
white – skin, white



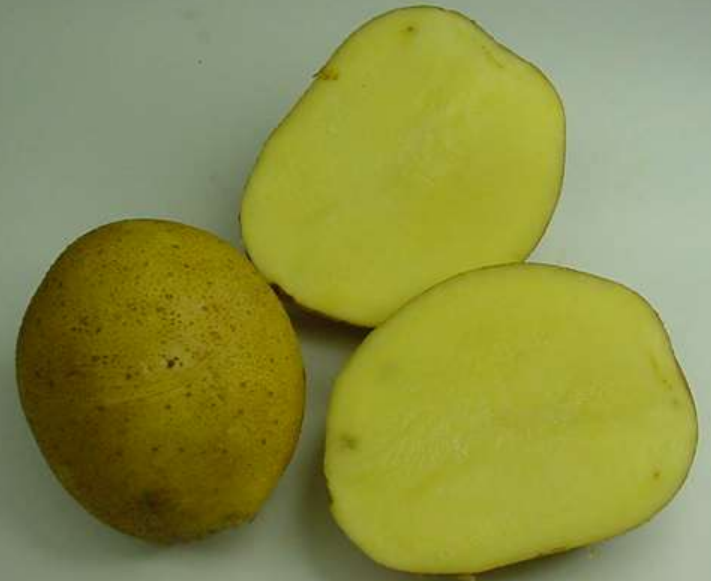
red – skin, white



russet – skin, white



yellow – skin, yellow



## External Characteristics

|             | RED              | RUSSET         | WHITE          | YELLOW               |
|-------------|------------------|----------------|----------------|----------------------|
| Skin Color: | red              | brown          | tan            | yellow               |
| Texture:    | smooth           | rough          | smooth         | smooth               |
| Flesh:      | white            | white          | white          | yellow               |
| Shape:      | round            | long           | round          | oblong               |
| Use:        | boiled<br>salads | baked<br>fries | fried<br>chips | baked<br>fries/chips |
| Key:        | redness          | longness       | roundness      | ?                    |

## Internal Characteristics

|             | RED      | RUSSET    | WHITE  | YELLOW    |
|-------------|----------|-----------|--------|-----------|
| Dry Matter: | 15-19%   | 17-21%    | 18-24% | 18-22%    |
| Starch:     | 10-13%   | 12-15%    | 13-18% | 13-16%    |
| Sp.Gravity: | low      | medium    | high   | med-high  |
| Glucose:    | high     | medium    | low    | low-med   |
| Fry Color:  | brown    | tan       | white  | off-white |
| Texture:    | pasty    | flakey    | grainy | flakey    |
| Firmness:   | soft     | semi-soft | dry    | semi-dry  |
| Taste:      | sl.sweet | bland     | bland  | sl.sweet  |



| <b>Sp. Gravity</b> | <b>% Dry Matter</b> | <b>Texture</b> | <b>Uses</b>                                   |
|--------------------|---------------------|----------------|---|
| 1.050-59           | 15.5-17.3           | soggy          | exc. salad<br>exc. canning                    |
| 1.060-69           | 17.4-19.1           | pasty          | exc. boiled<br>gd. salad<br>gd. canning       |
| 1.070-79           | 19.2-21.1           | waxy           | exc. mashed<br>gd. boiled<br>fr. can/fry/chip |
| 1.080-89           | 21.2-22.9           | mealy          | exc. baked<br>exc. fried<br>gd. chipped       |
| 1.090-99           | 23.0-24.8           | dry            | exc. chipped<br>gd. fried<br>fr. baked        |

# Storage is

a

**HOME**

**NOT**

a

**HOSPITAL**

**!!!**

# **@ Harvest**

**soil at 60-65% FC  
tubers at 50-65 F**

**Tubers from cool, wet soil  
bruise easily & store poorly.**

**dry, cloddy soil: more bruising**

**wet soil: pore - swelling,  
soil sticking, oxygen loss.**

**Best Time = morning**

# **CURING -- 2-8 weeks**

**Heal Bruises from harvesting**

**[disease spread & water loss]**

**Pre-Conditioning (chips)**

**[sucrose & glucose levels]**

**Cooling for storage**

**NEEDS: 50-60 F**

**90-98% RH**

**10-30 cfm/ton**

# HOLDING PERIOD

lower temperature (0.5 F/day)

|              |                             |
|--------------|-----------------------------|
| <b>SEED</b>  | <b>34 - 38 F / 1 - 3 C</b>  |
| <b>FRESH</b> | <b>36 - 42 F / 2 - 6 C</b>  |
| <b>FRIES</b> | <b>44 - 48 F / 7 - 9 C</b>  |
| <b>CHIPS</b> | <b>48 - 52 F / 9 - 11 C</b> |

Maintain HIGH Relative  
Humidity and  
Ventilation

# CONCERNS - HOLDING:

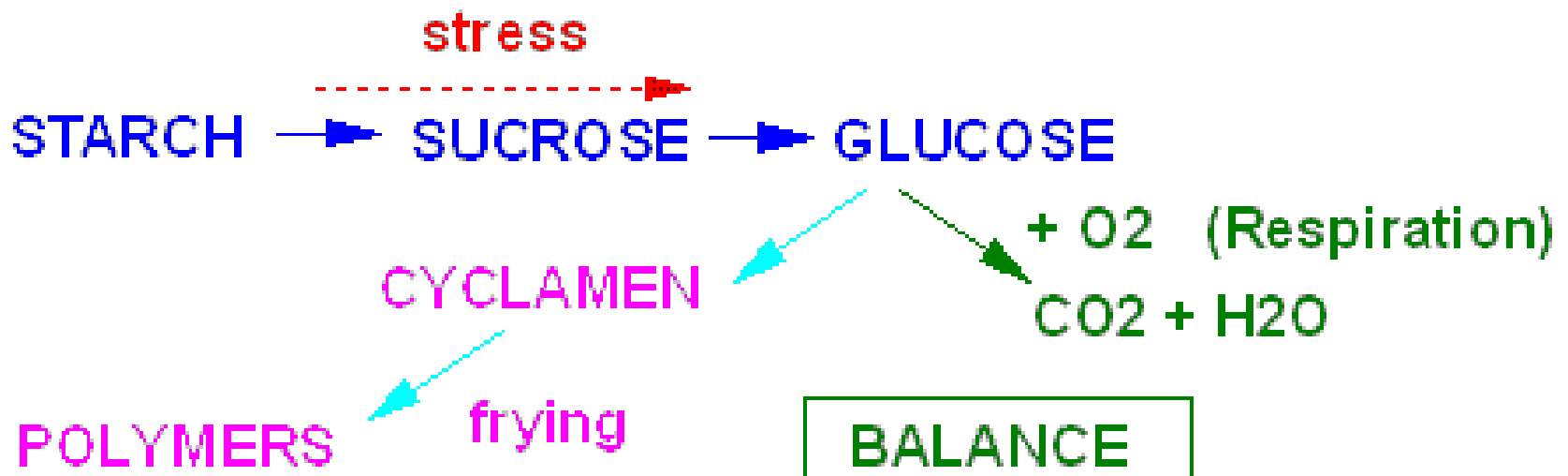
**SPOILAGE:** dry rot, wet rots (soft & leak)

**SPROUTING:** high temperature

**SHRINKAGE:** low humidity, high temp.

**SUGAR LEVELS:** low temperature

**RESPIRATION:** oxygen deprivation  
OR starch degradation



# **RE-CONDITIONING:**

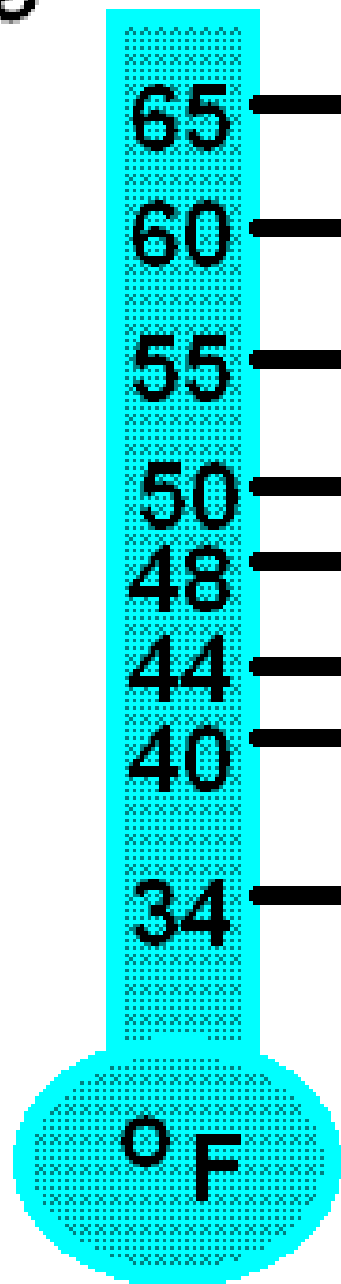
**(similar to pre-conditioning)**

**Prepares for shipping & planting  
- warming of tubers to reduce  
bruising during handling**

**Attempts to repair poor storage by  
burning off glucose**



Temperature  
Ranges  
for  
Storage  
Periods



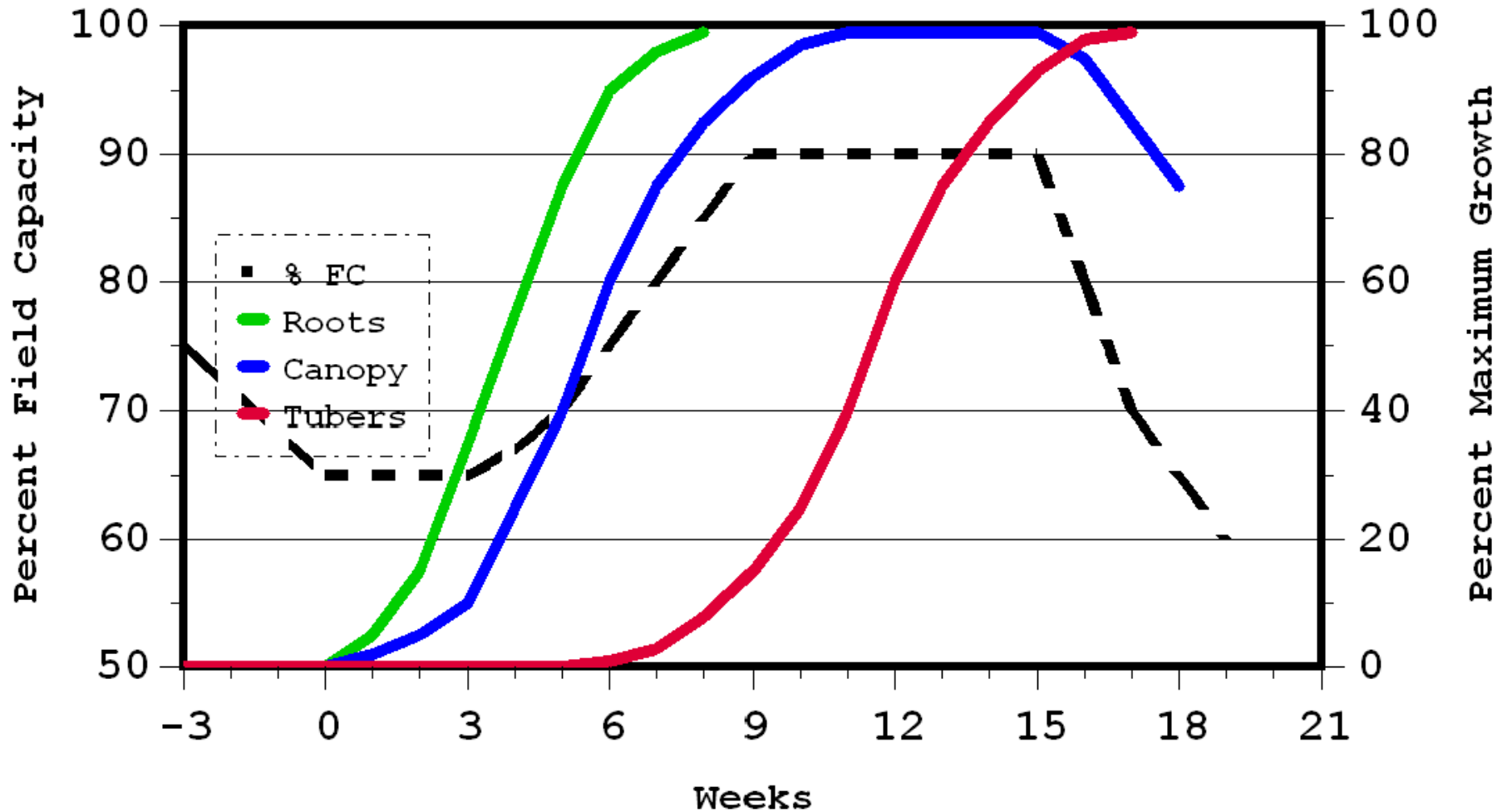
Seed Conditioning

Curing / Healing

French Fry Holding

Fresh Holding  
Seed Holding

Figure 3. Plant Growth and Soil Moisture Model  
 (Determinate, Mid-Season Potato Variety)



0 wk= Planting, 3 wk= Emergence, 5-6 wk= Tuber Initiation  
 8-9 wk= Full Bloom, 15 wk= Senescence, 18 wk= Vine Kill  
 Max. Growth Phases: <15%= Lag, 15-85%= Log, >85%= Flat

# QUICK REVIEW

| <b>stage</b>       | <b>highlight</b>             | <b>WAP</b>   | <b>WAE</b>  |
|--------------------|------------------------------|--------------|-------------|
| <b>PLANTING</b>    | <b>SEED PREP, FERTIL.</b>    | <b>0</b>     | <b>-3</b>   |
| <b>EMERGENCE</b>   | <b>WEEDS, ROOTS, FERTIL.</b> | <b>3</b>     | <b>0</b>    |
| <b>VINE GROWTH</b> | <b>VINES, HOOK/SWELL</b>     | <b>3-8</b>   | <b>0-5</b>  |
| <b>FLOWERING</b>   | <b>TUBER INITIATION</b>      | <b>6</b>     | <b>3</b>    |
| <b>FULL BLOOM</b>  | <b>VINES TO TUBERS</b>       | <b>8</b>     | <b>5</b>    |
| <b>BULKING</b>     | <b>PESTS, IRRIGATION</b>     | <b>8-14</b>  | <b>5-11</b> |
|                    | <b>TUBERS !!!</b>            |              |             |
| <b>MATURATION</b>  | <b>DYING VINES</b>           | <b>12-14</b> |             |
| <b>VINE DEATH</b>  | <b>TUBER MATURES</b>         | <b>14-16</b> | <b>12</b>   |
| <b>HARVEST</b>     | <b>BRUISING</b>              | <b>16-20</b> | <b>15</b>   |
| <b>STORAGE</b>     | <b>TEMPERATURE, RH</b>       | <b>20</b>    |             |