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# Potato cultivation

## Main recommendations

# Rotation

- Potatoes every 4 years
- Less risk of developing pests and diseases
  - Rhizoctonia, common scab, nematods
  - colorado beetle



## Rhizoctonia solani



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## Common Scab Streptomyces

**Nematodes**  
*Globodera rostochiensis*  
and *pallida*





# Fertilization

- Soil analysis is important to know the quantities to bring
- The need of the plant
  - **Nitrogen :**
    - ware potatoes :160 to 180 kg
    - Potatoes seeds: 100 to 120 kg
  - **Phosphorus 100 to 120 kg**
  - **Potash : 200 to 250 kg**
- Some is provided by the soil, the rest is brought by manure and chemical fertilizer



# Value of organic manuring

➤ Example of cattle manure : fertilizer supply

Quantity	N	P2O5	K2O	MGO
30 tonnes/ha	32	51	213	45
40 tonnes/ha	42	68	284	60

# Potatoe seeds

- High level of quality is necessary : without virus
  - Not to exceed 3 générations
  - After the yield decrease, because it is impossible to control the quantity of virus
- During the production of seeds, it must remove sick plants and control aphids to avoid contamination

# Quality and quantity of seeds

- Seeds should be kept cold and reheated before planting
  - Cold for dormancy and heat for vigor and number of germs
  - It is important to separate seeds and warehouse potatoes
- Quantity of seeds for warehouse potatoes or **seeds**

➤ 28/35 mm :	1tonne/ha	<b>1,2</b>
➤ 35/45 mm :	1,8 tonnes/ha	<b>2,1</b>
➤ 35/50 mm :	2,5 to 2,8 tonnes	<b>3</b>
➤ 35/55 mm :	3 tonnes/ha	<b>3,5</b>
- It is an average which depend on the shape of the tubers



# Planting and Hilling

- Planting must be done in a soil dry and warmed
  - For a quick start
- Potatoes seeds should be 5 cm below the ground
- After planting a first ridge of about 10 cm should be made over the planted potatoes.
- The final ridge should be at least 15 cm high so that the potatoes are finally covered by at least 20 cm of soil
  - This reduces the risk of having green tubers





# Herbicide

- Soil herbicides are used to control the bad weeds then the final ridge should be built
- about 2 or maximum 3 weeks after planting, before emergence potatoes
- herbicide should then be applied after rain or irrigation because these soil herbicides need humidity to be fully active.
- Stop working the soil after treatment because the herbicide forms a film on the soil surface



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Example Herbicide	Quantity L. or KG/ha
Zenkor	0,5 - 1
Metrabuzin	0,5 -1,2

# Fongicide

- The two most important diseases are mildew (*Phytophthora infestans*) and *Aternaria*
- Depending on the risk, choose résistant or tolerant varieties or protect with fungicide treatments
- Fungicide treatment must be **preventive**, you must apply fungicide when the first symptoms appear



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**Late blight**  
(*Phytophthora infestans*)



**Alternaria**



Example Fongicide	Quantity L or KG / ha
Planeta	3
Ridomil Gold	2,5 - 3
Metalaksan	2,5
Bravo	2 - 3
Ridolet	2,5
Karmen	2,5
Cuprum MZ	1

# Insecticide

- For ware house potatoes the most important parasite is colorado potato beetle
- For potato seed it is aphids
  - Aphids are the vectors of virus diseases
  - Plants infested with virus diseases lose a lot of quality and give bad seeds



**Colorado potato beetle** (*Leptinotarsa decemlineata*)



**Aphids**



Example insecticide	Quantity L or kg/ha
Confidor	0,15
Mosetam	0,1
Selestop	0,8





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# Natural predators of aphids



**ladyburg**

**Hoverfly** (family Syrphidae)

# Topkill

- When the maturity arrives, it is necessary to stop the vegetation
  - Either by grinding the stems, or with a chemical treatment (with diquat for example) or a combination of the two
- After the canopy has been removed the potatoes should stay in the soil for about two or three weeks. This period is necessary for the potatoes to set their skin.



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Destruction of  
stems by grinding



Chemical  
dessication

# Harvest and storage

- the potatoes should be stored in a dry and dark place
- During the two first weeks of storage, good ventilation is necessary to evacuate the heat and moisture from respiration and perspiration
- Then comes the dormant period, it is necessary to gradually lower the temperature by about 1 degree per day. **Use air with 2°C below the temperature potatoes to avoid dehydrating**
- Temperature control and ventilation system is recommended to ensure proper storage
- For potatoes intended for industry (French fries or crisps) with a long storage, more than three or four months, anti sprouting treatment with CIPC (chlorprofam) is necessary
- **Never keep potato seeds in a room where there has been anti sprouting treatment**



# Storage temperature

Type of potatoes	Recommended température
Seeds	2 – 3 °
Table	3 – 5 °
French fries	6 – 7 °
Crips	7 – 8 °

# Specification for production of potatoes seeds

- Increase plant density
- Decrease the nitrogen dose
- Protect the crop from aphids
- Remove diseased plants
- Will stop vegetation by desiccation



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## Different virus diseases





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# Fodder beet



**An additional plant in the rotation and  
an interest for livestock**





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# Fodder beet in the stable





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# Or consume directly on the field





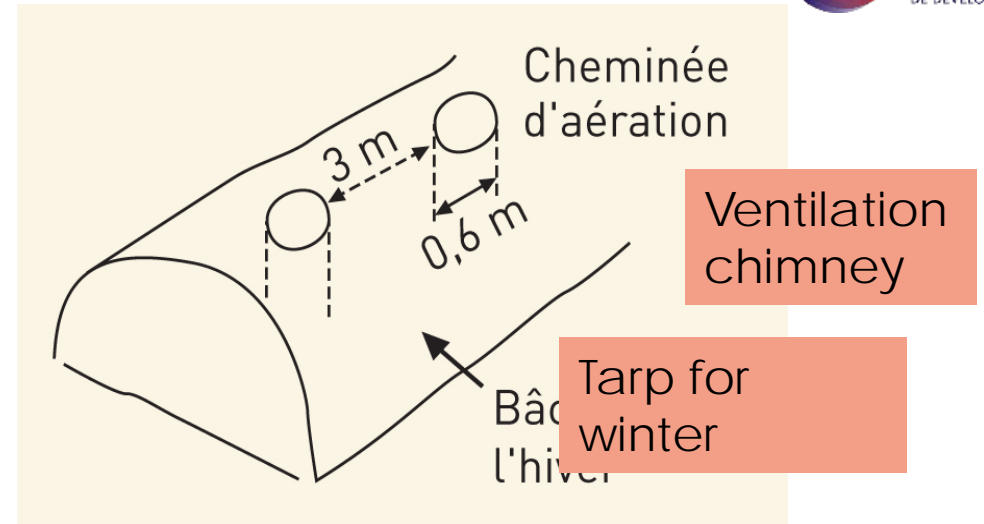
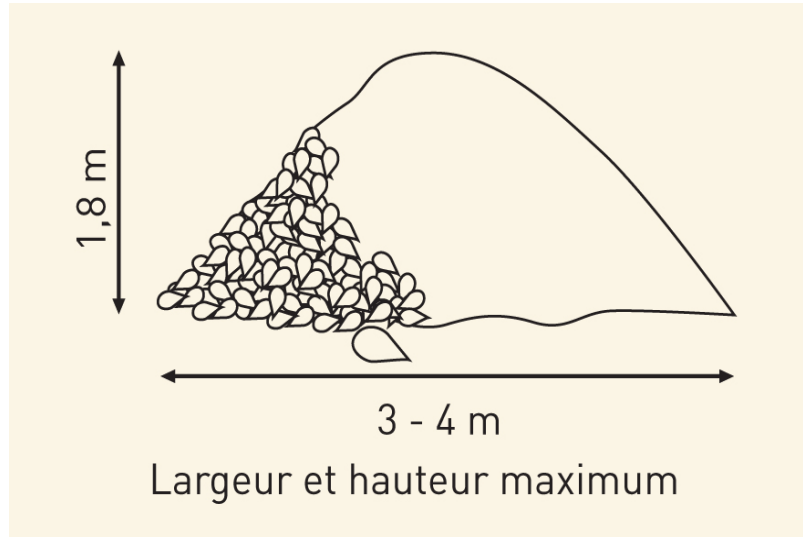
# Main recommendations

- Seedling
  - Just after preparing the soil to keep the seedbed moist
  - Depth : 1,5 to 2 cm
  - Spacing : 50 cm between rows and 18 to 20 cm on the row
    - Goal get 90 000 to 100 000 plants per ha
  
- Herbicide
  - Just after seedling with product based Metamitron
  - In vegetation : with product based Phenmedipham and Ethofumesate



# Fertilization

KG/HA	N	P	K
Without manure	150 -170	90 -100	240 - 260
With 30 t manure	90 -100	60 -70	160 -180



# Storage silo