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Agroscope



Repubblica e Cantone  
Ticino



# Kudzu (*Pueraria lobata*) in southern Switzerland

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# Origin of *Pueraria lobata*

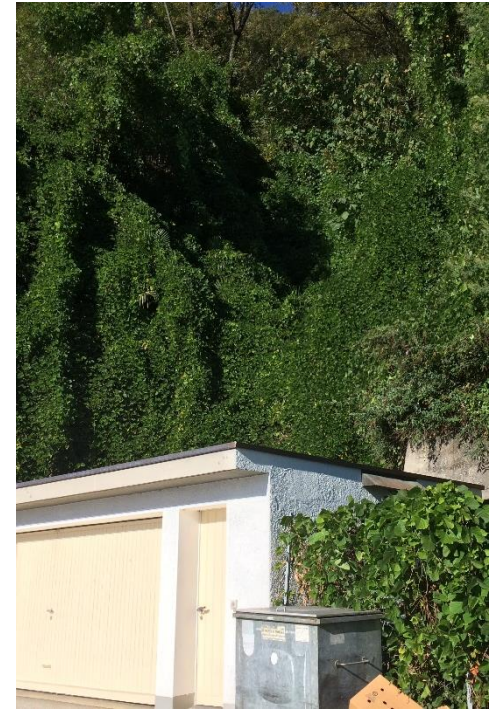


Source: web

- Native from East Asia
- USA: Introduced in 1876
  - In 1930s the plantation was highly recommended
  - Considered a nuisance in the 1950s
  - Labelled as noxious weed in the 1990s



# Description of *Pueraria lobata*



- Belongs to the legume family [Fabaceae]
- Is a perennial climbing or trailing vine
- Ecological requirements: - winter 4 - 6 °C / summer more than 27 °C  
- 1000 mm rainfall





# Description of *Pueraria lobata*

Main ecological traits making it invasive:

1. Rapid and competitive growth, up to 30 cm/day
2. Extensive root system, including massive reserve tubers
3. Vegetative reproduction through rooting vine nodes
4. Generative reproduction through abundant seeds production

1.



2.



3.



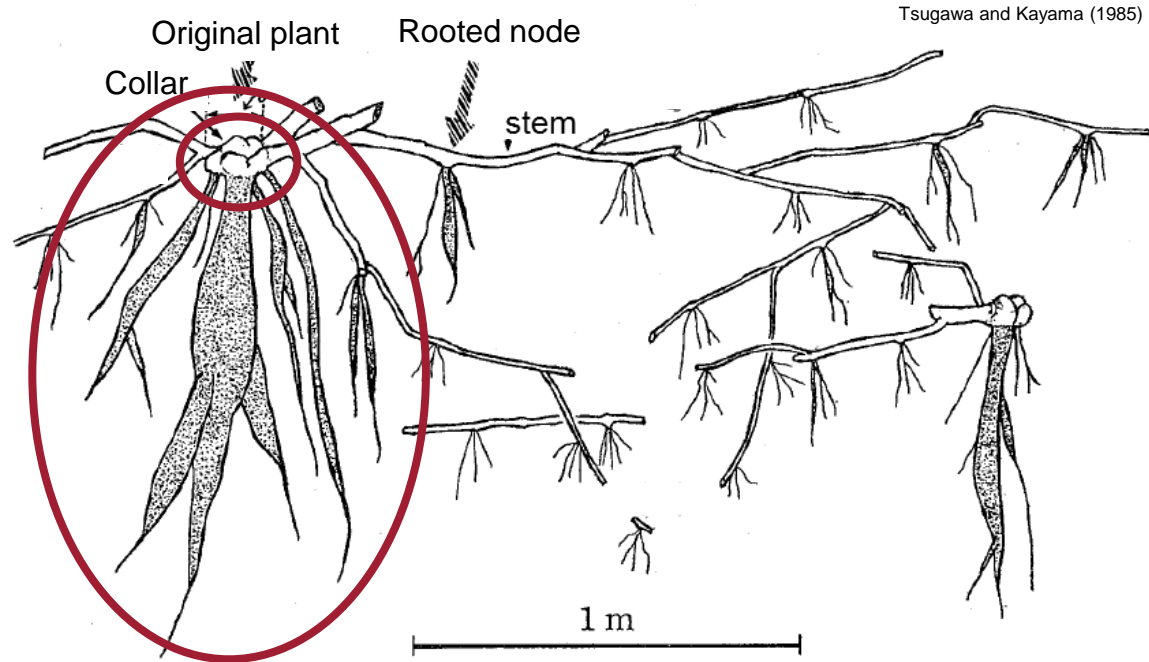
4.





# Description of *Pueraria lobata*

Vegetative reproduction: the root system



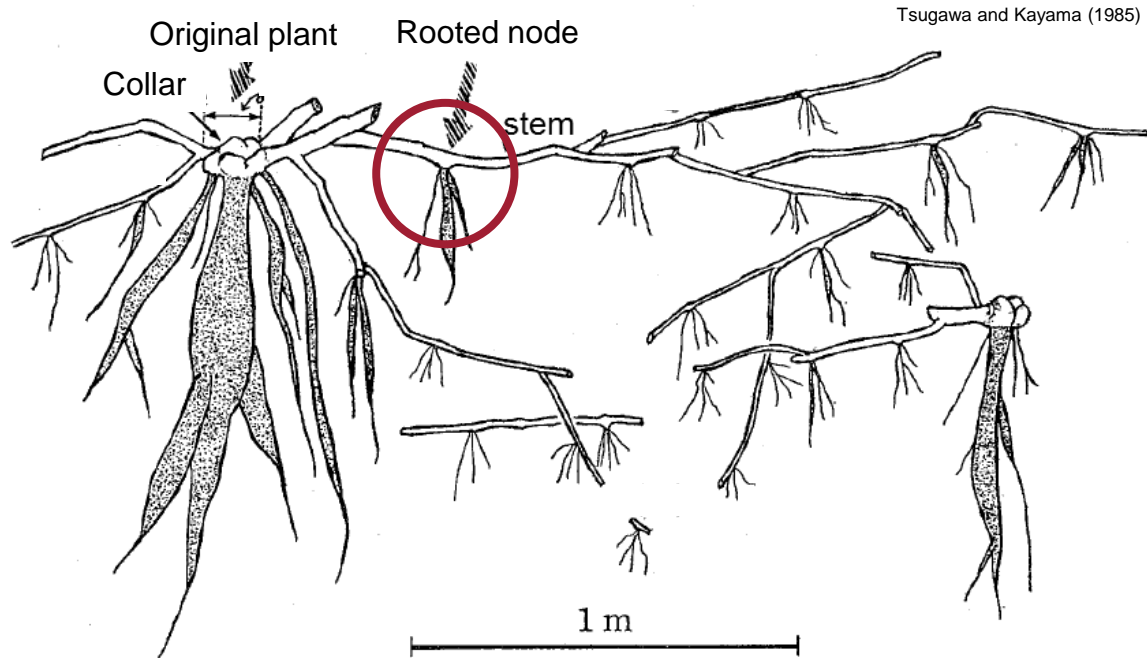
## Original plant from seed

- Reserve tubers
- Collar with vegetative buds from where plant originates:
  - aerial vines
  - trailing-buried vines



# Description of *Pueraria lobata*

Vegetative reproduction: the root system



## Rooted node

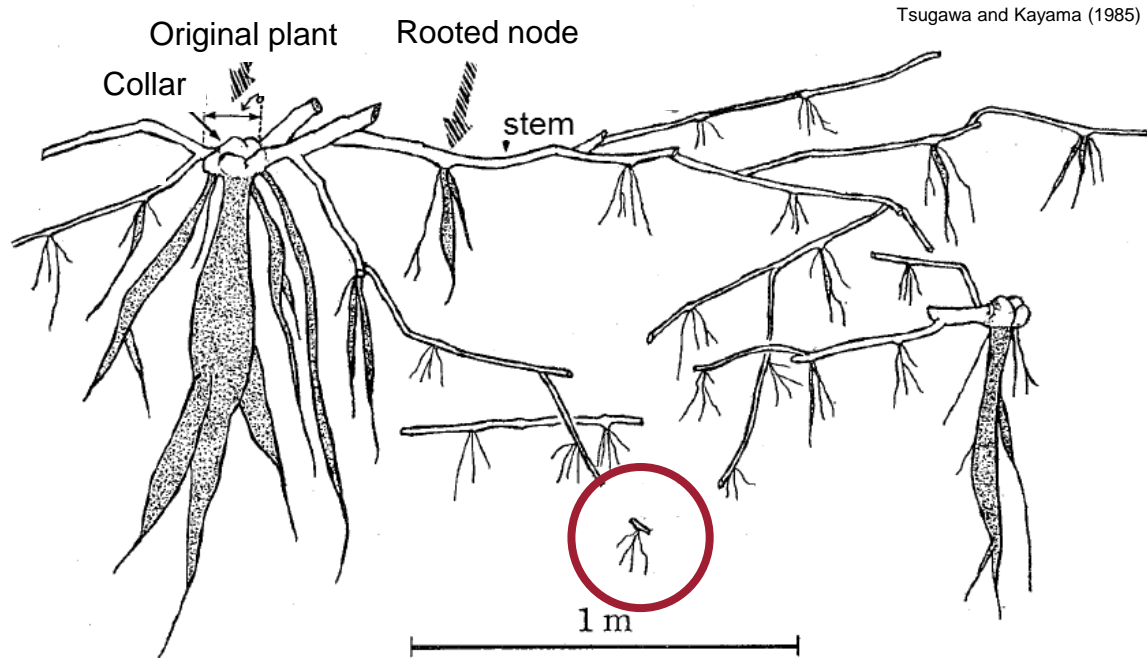
- Node of a buried vine with vegetative buds that originates:
  - new aerial vines
  - new roots





# Description of *Pueraria lobata*

Vegetative reproduction: the root system



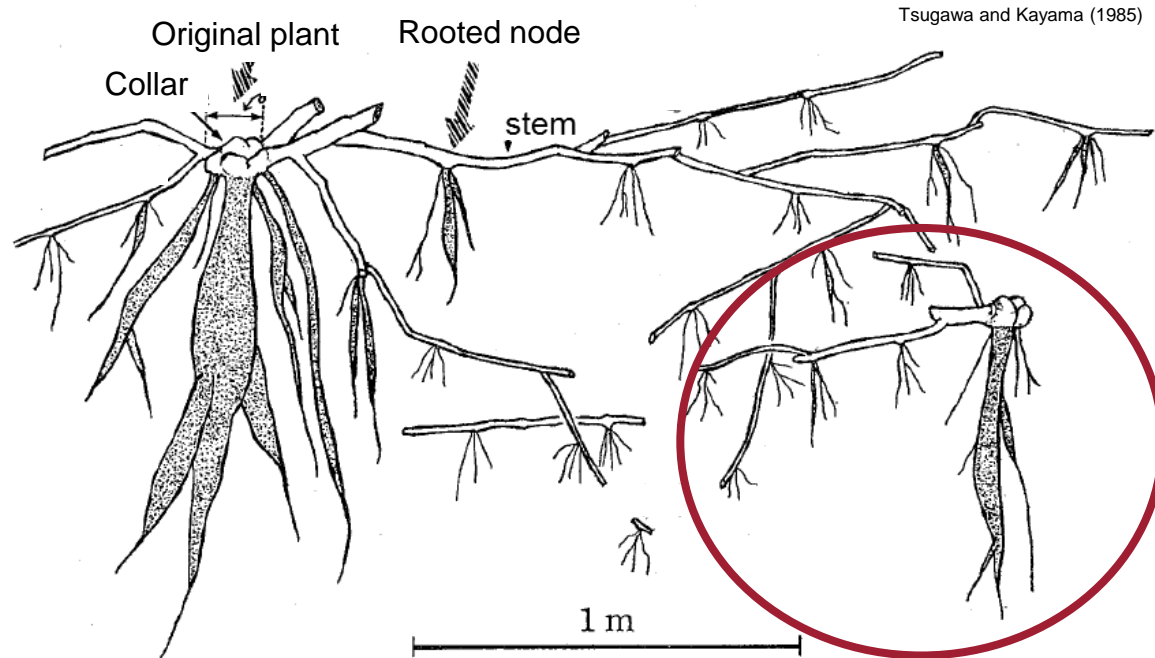
## Newly detached, independent rooted node

- Node of a buried vine that get independent from the original seed plant



# Description of *Pueraria lobata*

Vegetative reproduction: the root system



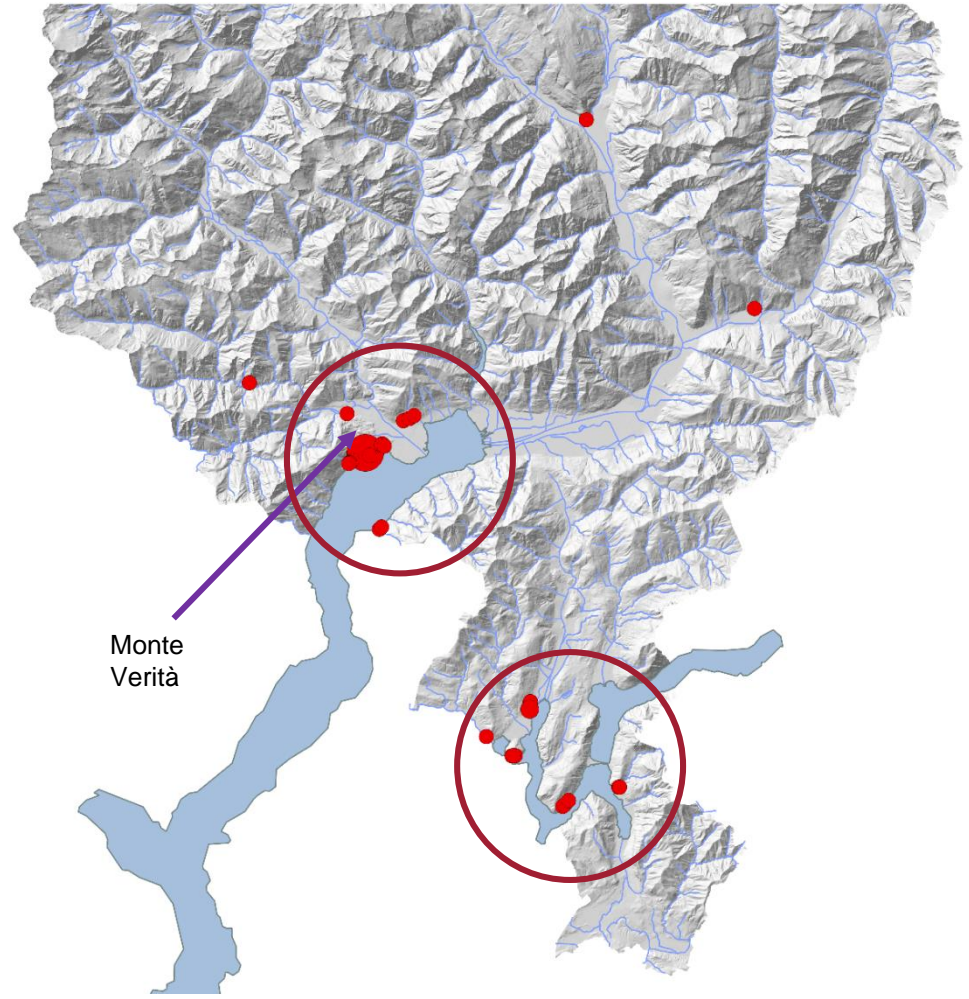
**Detached, independent rooted node forming new reserve organs**

- New plant originated from buried vine nodes that start producing own reserve tubers



# *Pueraria lobata* - in southern Switzerland

- Present since almost 20 years
- 33 outbreaks known
- Shows good growing behavior in Southern Switzerland
- Mild climate around the lakes is particularly favorable





# Increasing problem in the forest

Sommer habit  
Losone



## Summer

- Overgrows forest trees and understory
- Reduces and threatens forest functions, including biodiversity

Winter habit  
Dirinella

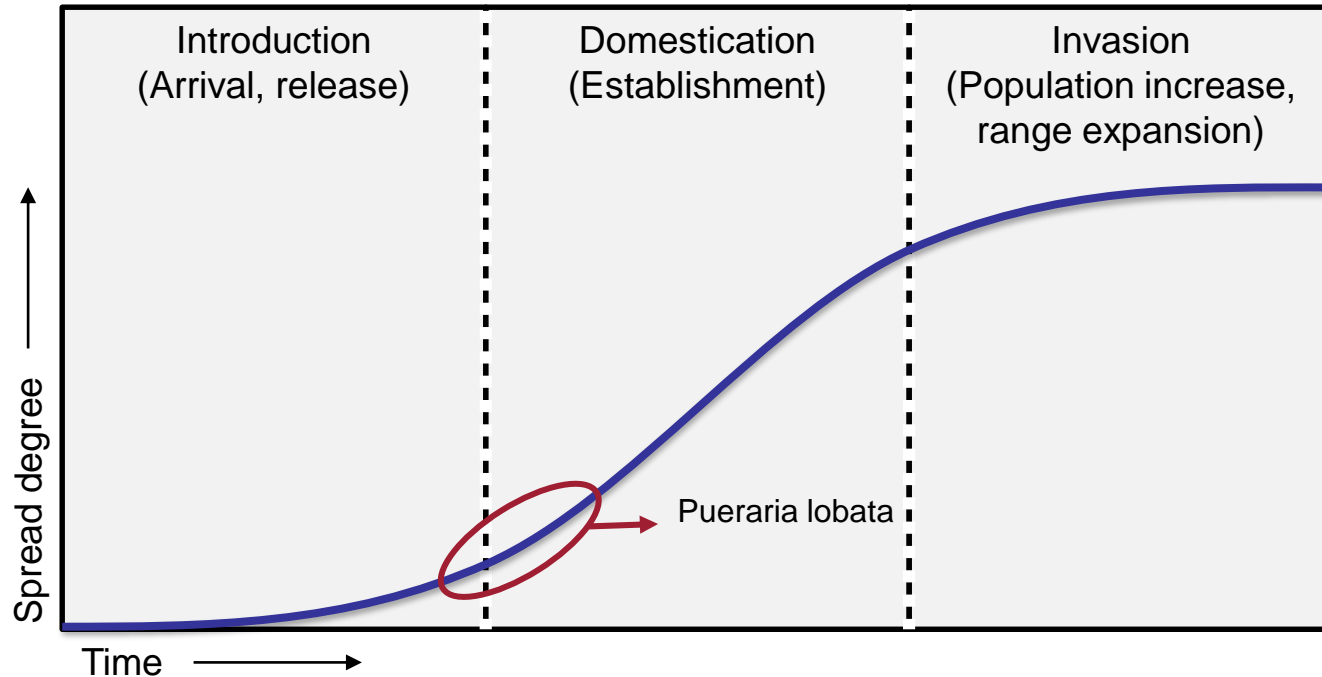


## Winter

- Represents a dangerous fuel continuity from soil to the crown in case of forest fires

# *Pueraria lobata* - in southern Switzerland

Invasion stage in southern Switzerland



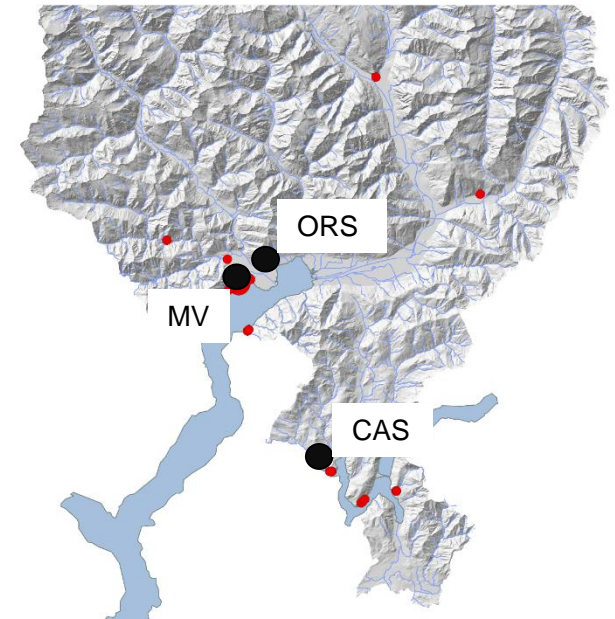
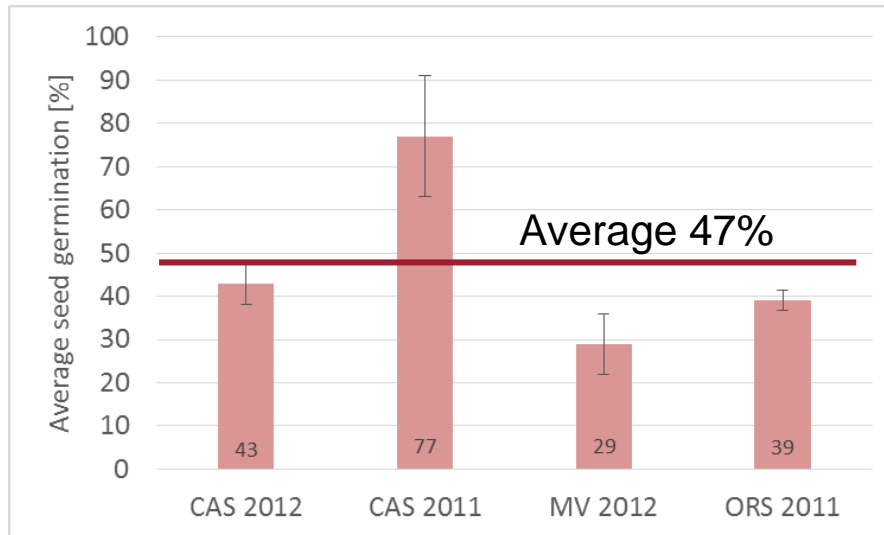
Considering the cost/benefits, we have to act now!





# Seed germination in greenhouse

Seed germination test in greenhouse in 2013



**Average germination of 47%**  
**Germination range of 22% - 88%**



# Seed germination in nature

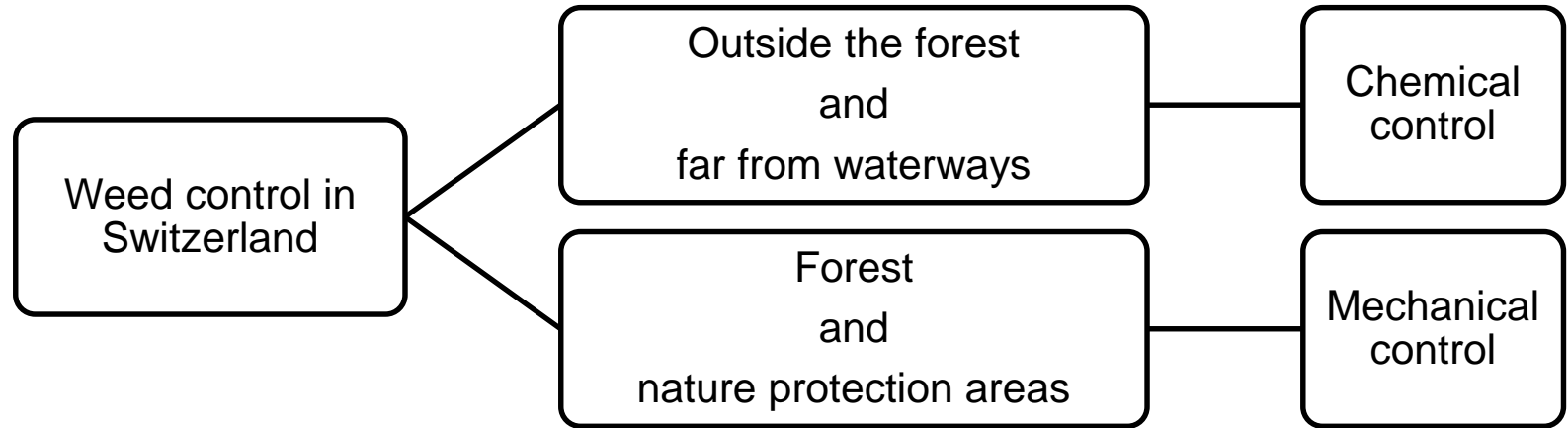
Generative reproduction confirmed in the field (Dirinella, 2016)



Cotyledons from seed germination



# Control of *Pueraria lobata*

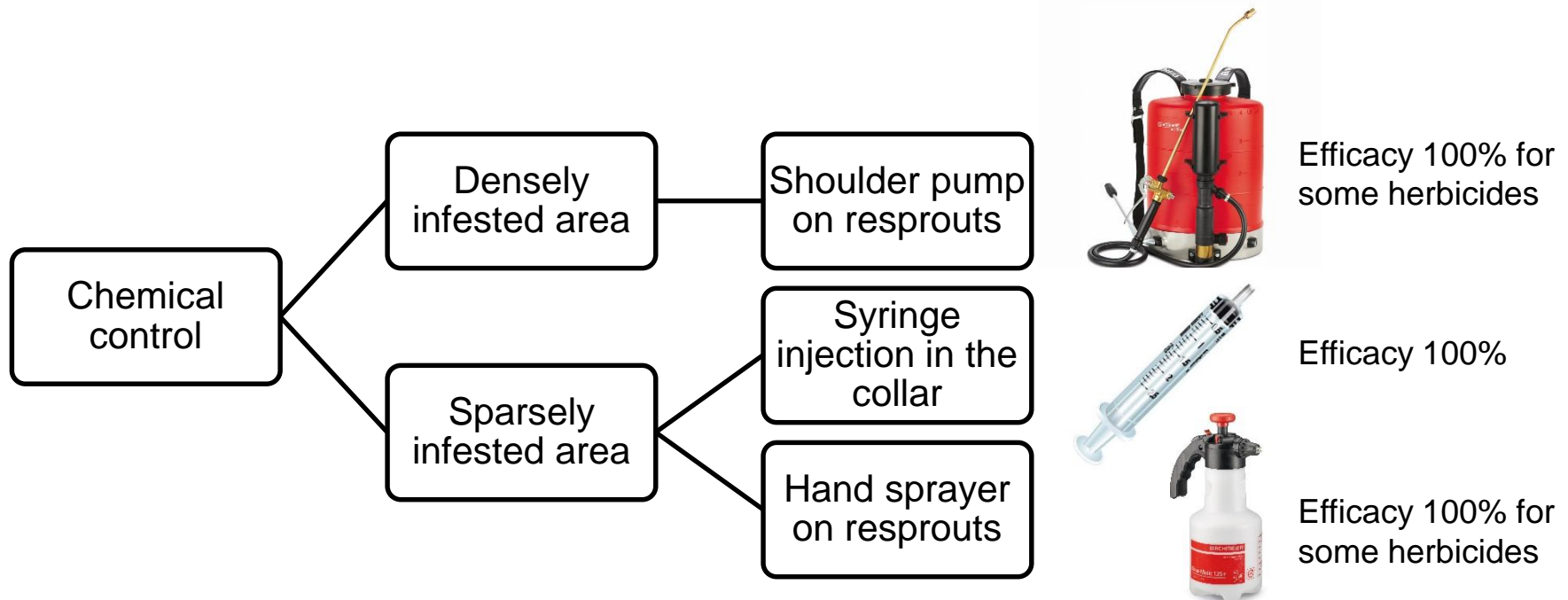






# Chemical control of *Pueraria lobata*

The 3 following strategies were tested at Monte Verità in 2012



**Chemical strategies seem to work well  
with a persistent effect**



# Mechanical control - node removal

**Node removal** - ongoing field experiment in Ticino

Concept: to remove all vegetative buds

## Procedure:

1. Summer  
- cut of aerial vegetation
2. When new resprouts reach 20-30 cm of growth  
- node removal
3. After 30 days  
- control and removal of the nodes left

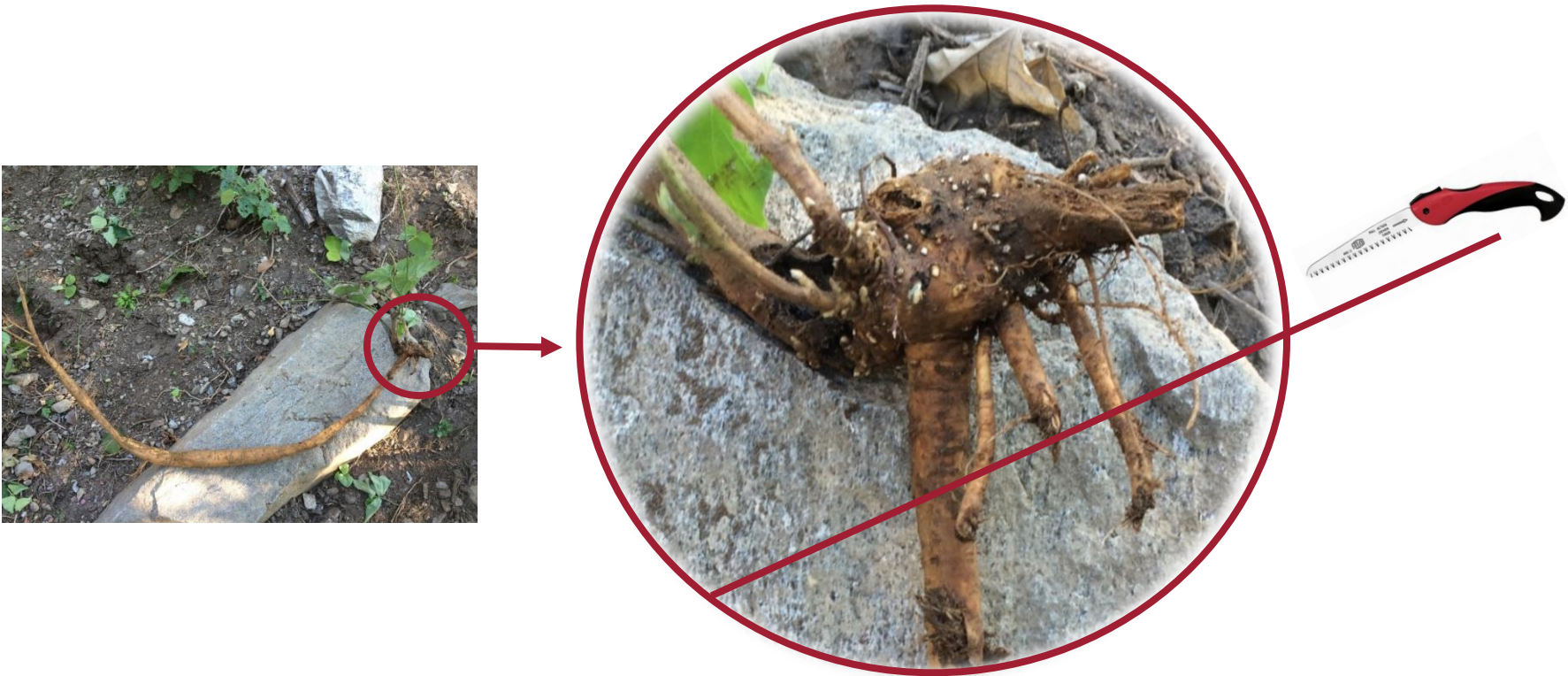
Procedure may be repeated in the following years (3-4 years) until total disappearance of *Pueraria*





# Mechanical control - node removal

Remaning tubers are not able to resprout!

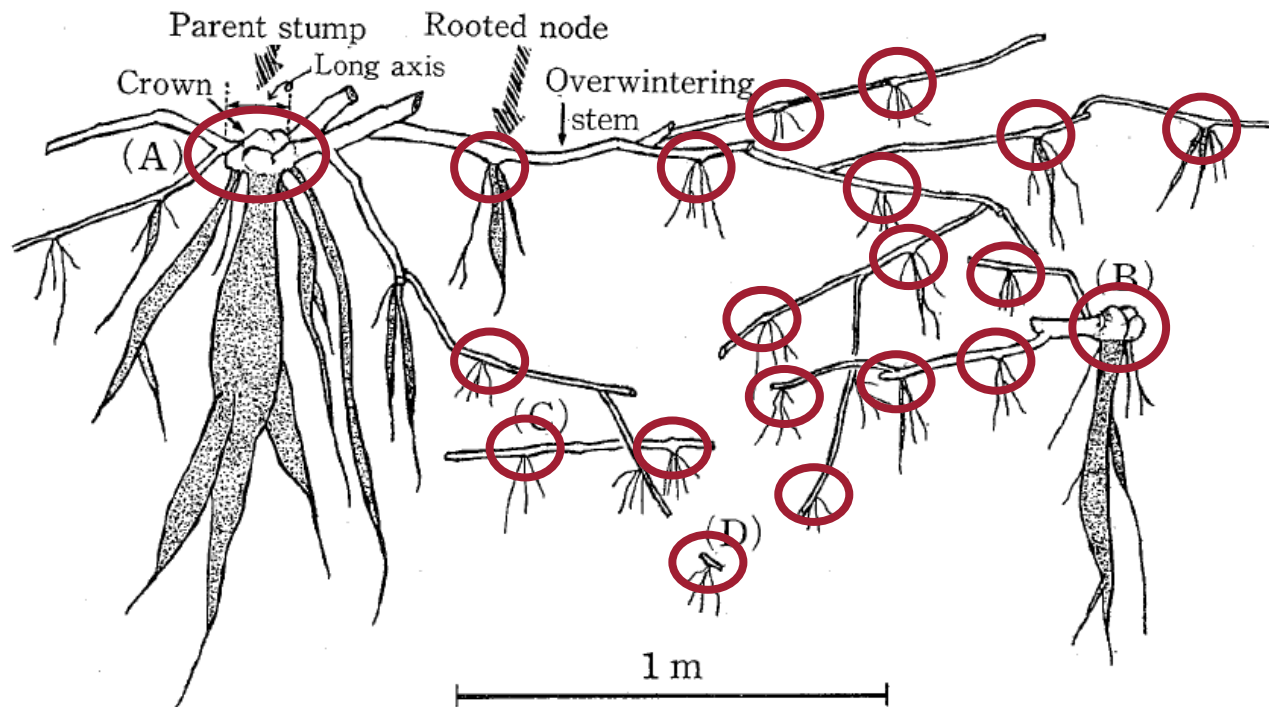






# Mechanical control - node removal

Long term procedure considering the meticulous work to remove the many nodes





# Mechanical control - node removal

Ongoing experience in Losone

1.



1. Starting situation
2. Node removal after 20 days of the cut of vegetation
3. Control after 30 days of the second node removal

2.



3.



# Conclusions

## Kudzu

- has a great invasive potential
- In southern Switzerland it is at early stage of invasion ...
- ... but it has a high potential of damage in the forest (less in agriculture)

## Control strategy in southern Switzerland

- Varies according to the outbreaks (forest and protected areas vs agricultural land)
- Bases on life-history traits of the species

**While I was talking to you, the plant has continued to grow**





# Thank you for your attention



**Agroscope** good food, healthy environment