



SIMBIOSYS

Sectoral Impacts on Biodiversity and Ecosystem Services



NUI Galway
OÉ Gaillimh



Funded as part of the Strategy for Science, Technology and Innovation

Developing landscaping and management regimes that resist invasion by invasive alien plants.

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Overview

- Background to research
- Design of Experiment
- Results to date

Roads: opportunities for alien invasive plants



A. Construction phase

B. Operational phase

Transfer of plant material

Management of vegetation

Landscaping decisions

Arrival of plant material

Disturbance of plant communities

A. Construction Phase

Transfer of Plant Material



-Soil Movement

-Tracks of construction vehicles

Landscaping Decisions

-Base material used



-Plants used in landscaping



B. Operational Phase

Management of Vegetation



Inadvertent Disturbance of Plant Community

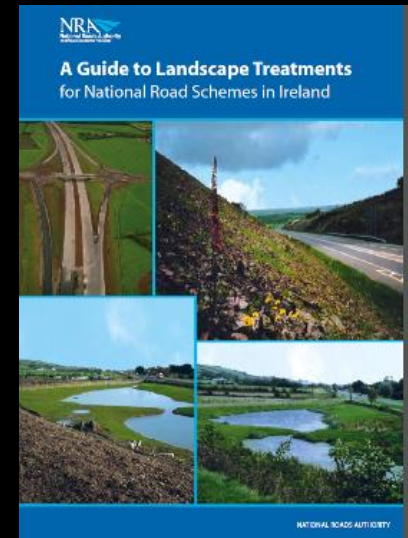


Research: Bringing 2 Aspects Together

- Verges - What conditions facilitate invasion?



- NRA Landscaping Guidelines
– *do they make a difference?*





Experimental Design

(I) Plant selection



4 Plant Species

- known or potential problem on road verges
- A) Japanese Knotweed (JKW) *Fallopia japonica*
- B) Japanese Rose or Shrub Rose (RR) *Rosa rugosa*
- C) Buddleja or Butterfly-bush (Budd) *Buddleja davidii*



D) Winter Heliotrope (WH)

Petasites fragrans



JKW

- In the list of World's 100 most invasive species (IUCN)
- Potential to regenerate and multiply in several ways – but especially clonally
- Can delay road schemes significantly (3 yr delay Fareham, Hants.)



Rosa rugosa (RR)

- Landscaper's delight

*Attractive foliage, *pretty flowers, *nice fragrance, *gorgeous rosehips

*mildew-resistant *many uses



On Danish coast (Lise Frederiksen)



N22 Clydagh Bridge, Co. Kerry



Buddleja
(*Buddleja davidii*)
Butterfly-bush:
...does what it
says on the tin!



Winter Heliotrope (WH)



Experimental Design

(II) Road Verge replicates

10 REPLICATES EACH OF:

- Topsoil (pre-guidelines)
- Standard Grass Seed Mix (SGSM)
(pre-guidelines)
- Subsoil (post-guidelines)
- Naturally recolonised plant community (NR)
(post-guidelines)

Plant Material

JKW

RR

Budd

seed



stem



Root /
rhizome



WH

Base Material



Soil Fertility



Laying out the experiment...



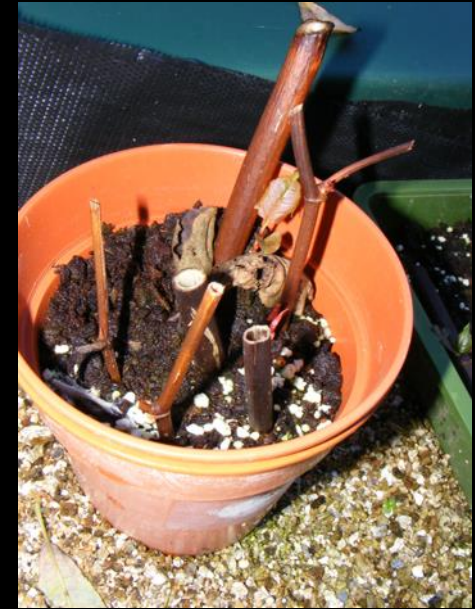
The horticultural approach...



JKW seeds on compost



JKW stems on compost



JKW semi-ripe cuttings

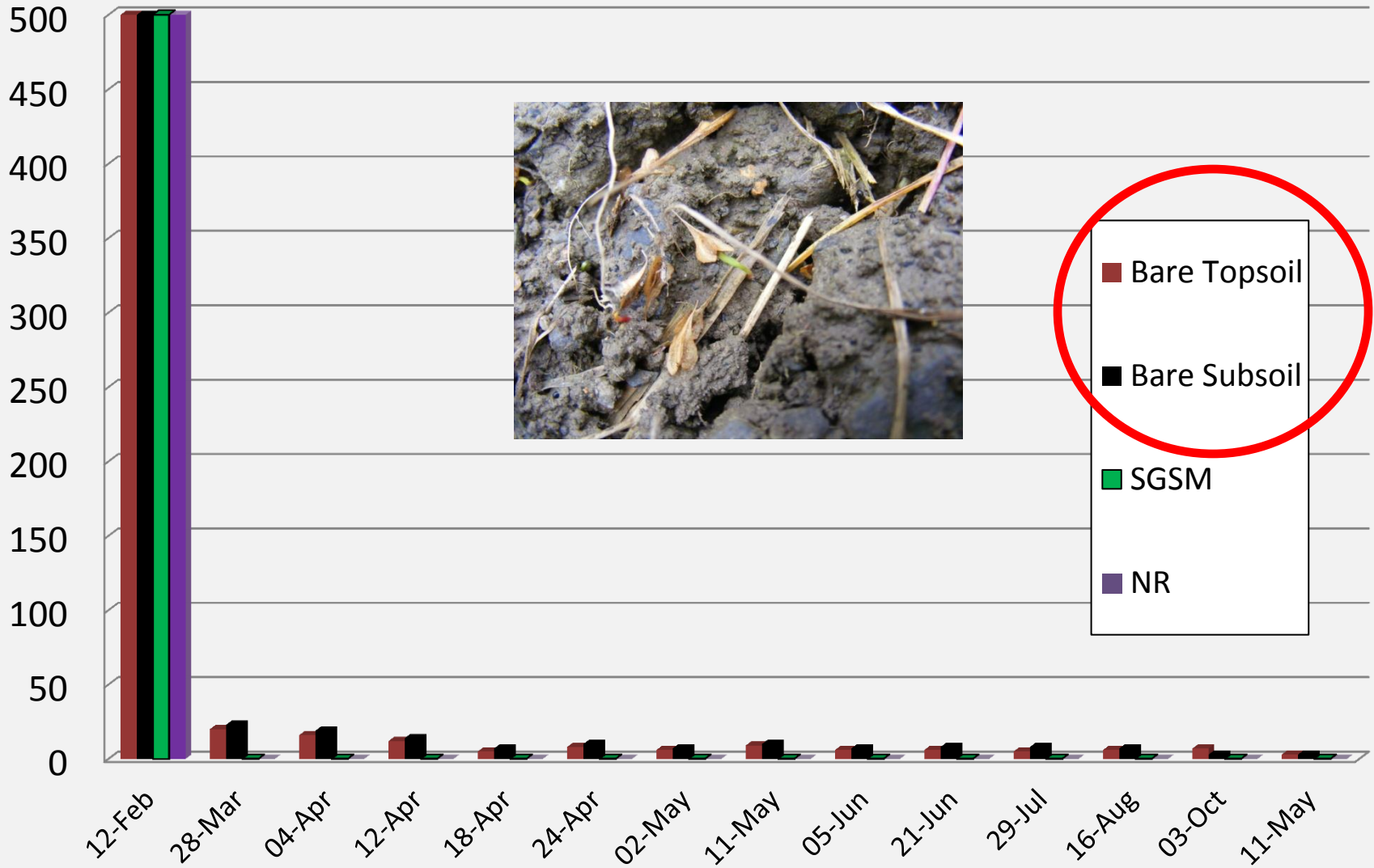


Budd stems in/on compost

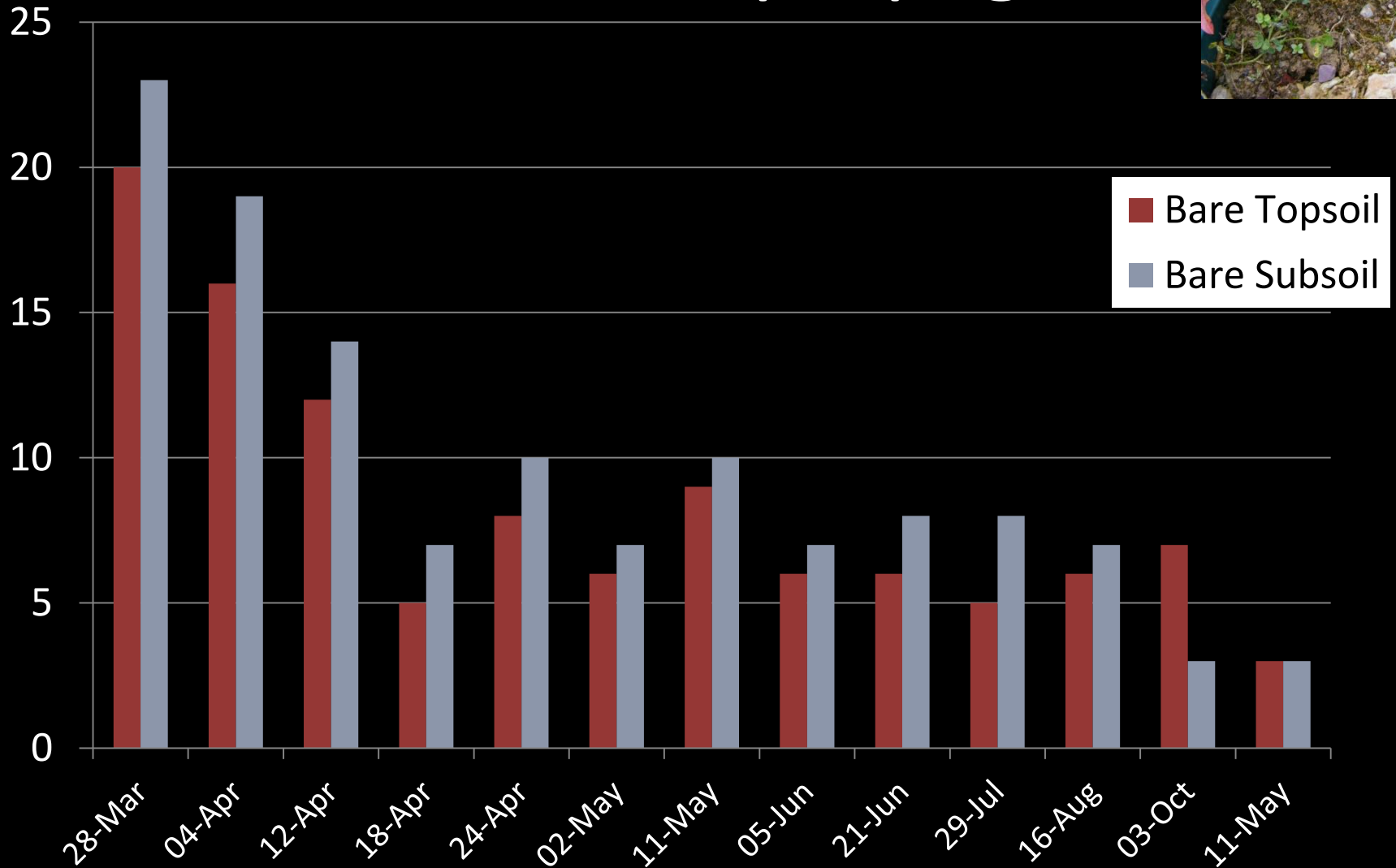


RR stems on compost

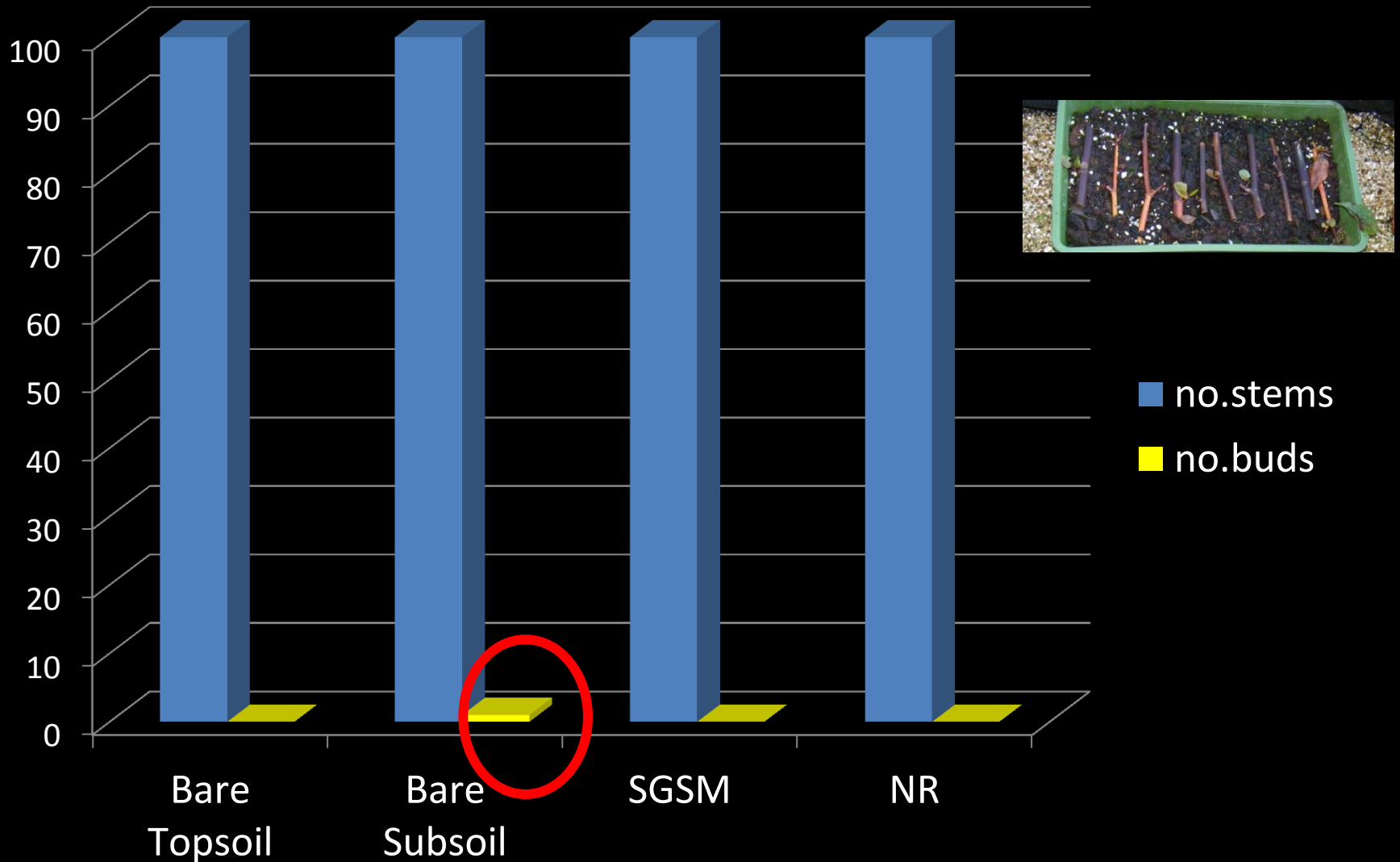
JKW propagules: seeds / emergent plants



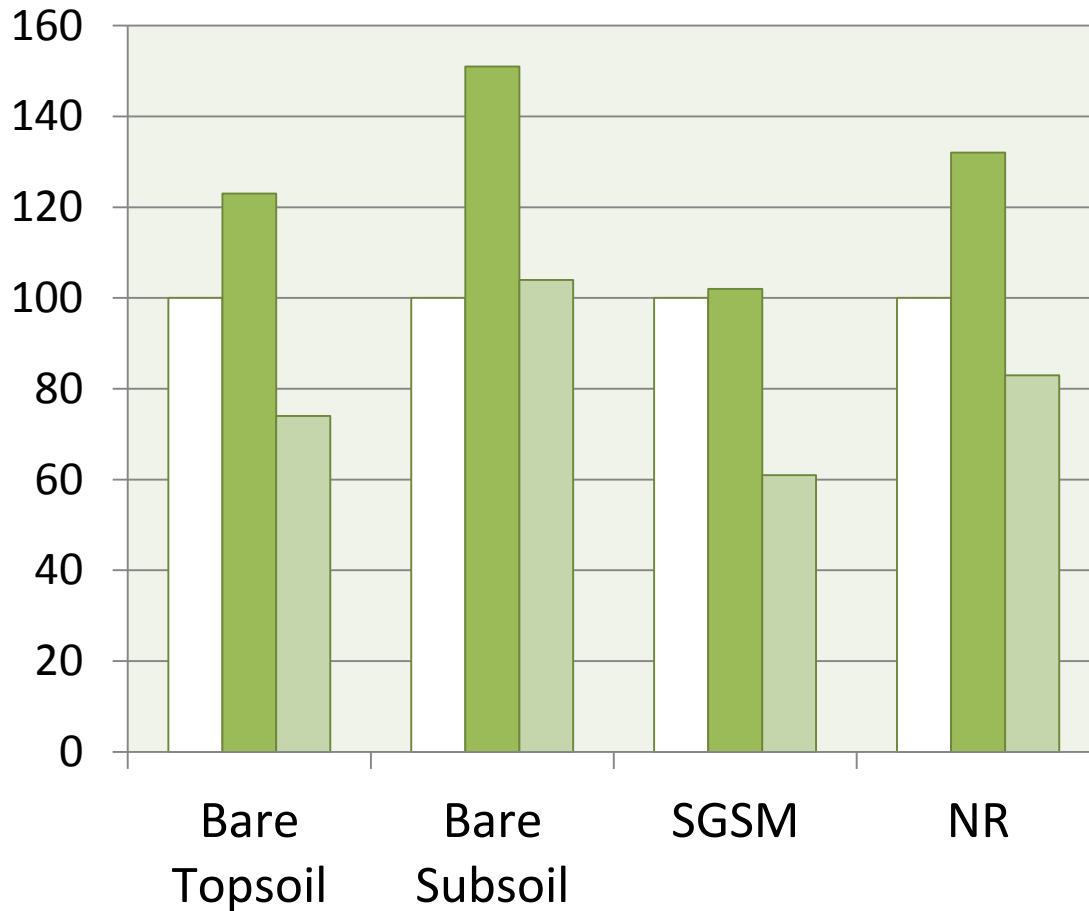
JKW from seed propagules



JKW: Stems generating buds/shoots

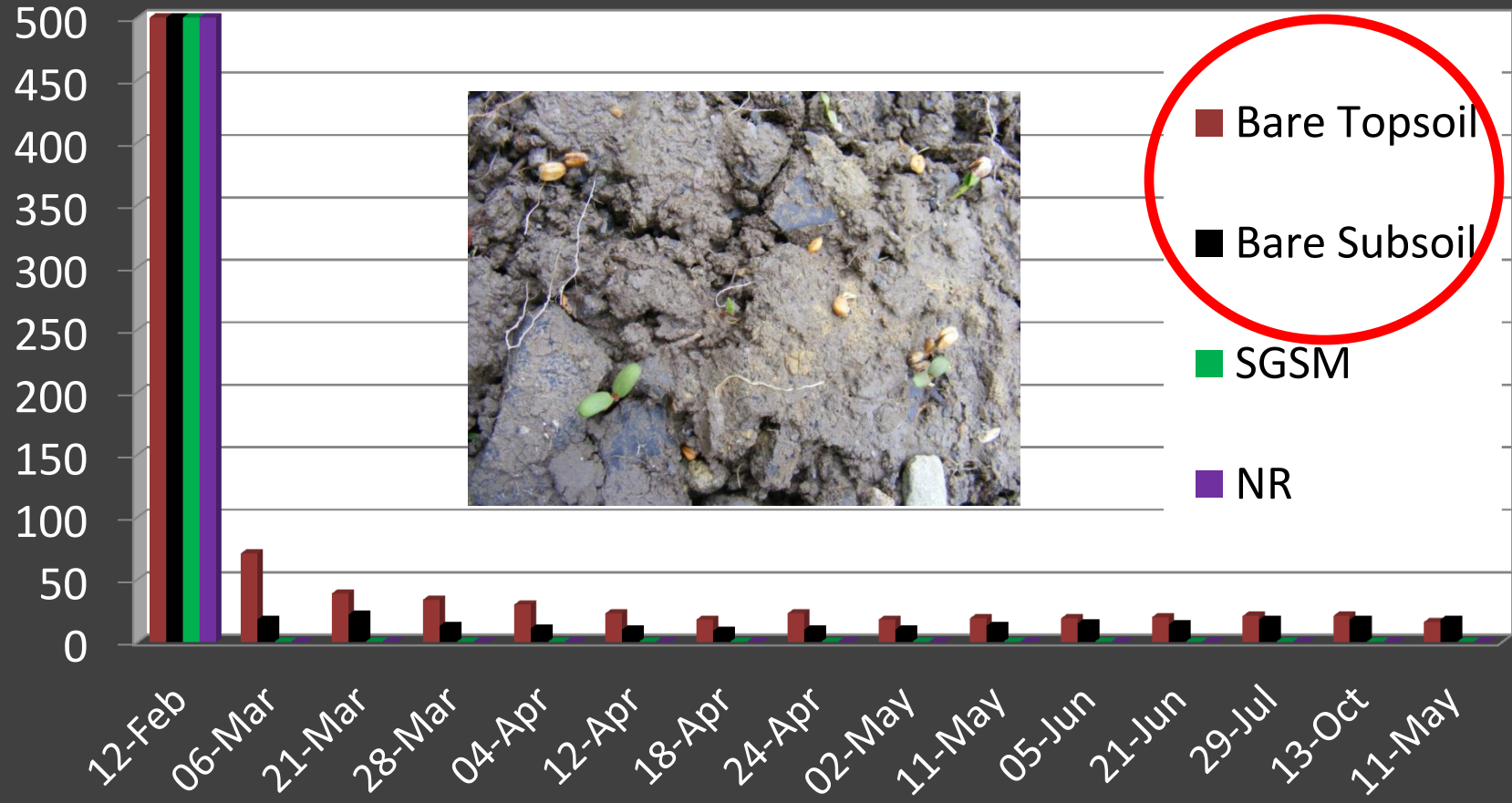


JKW: Rhizomes generating shoots

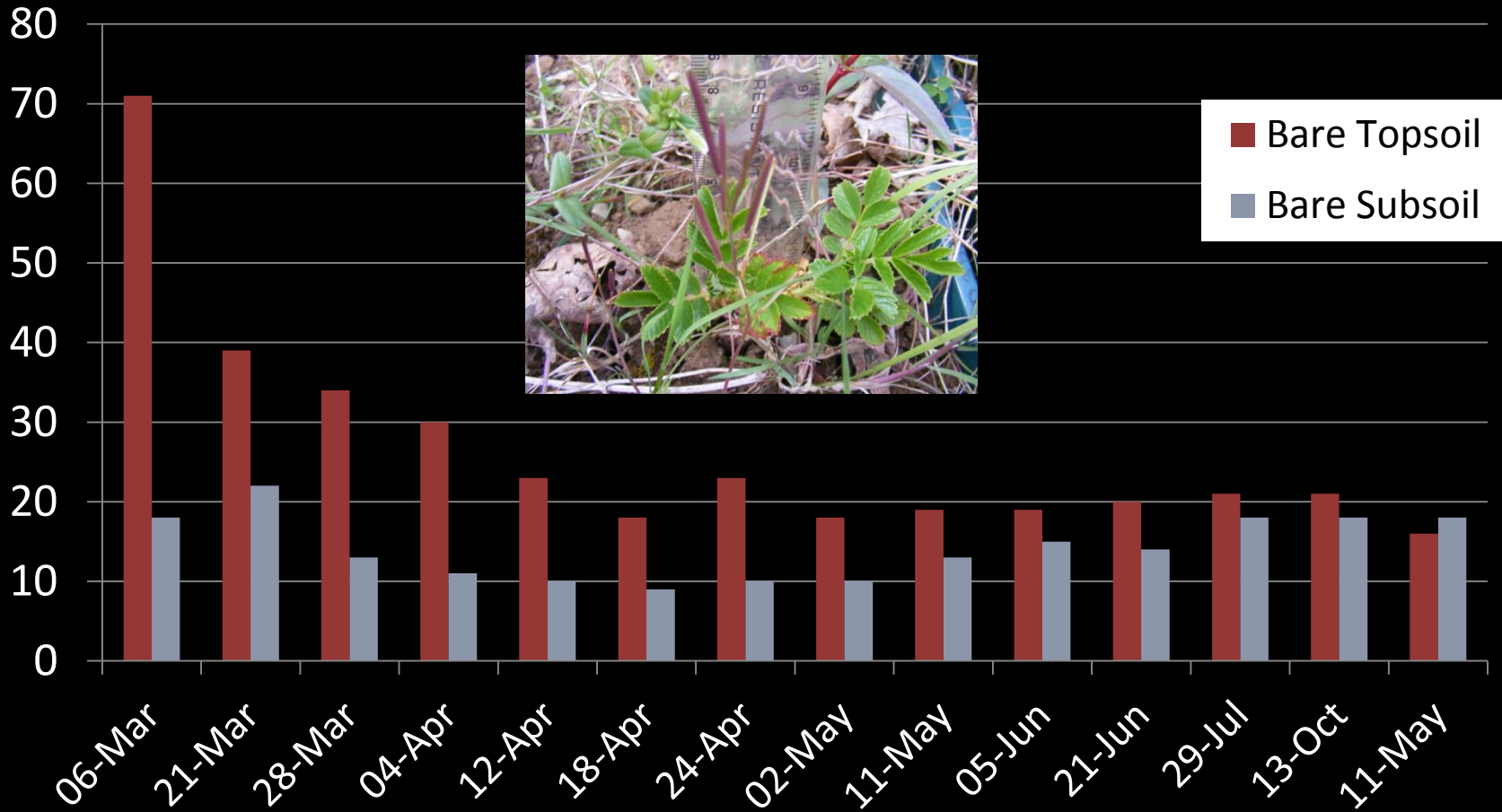


- no. of fragments Aug 2012
- no. of shoots Oct 2012
- no. of shoots May 2013

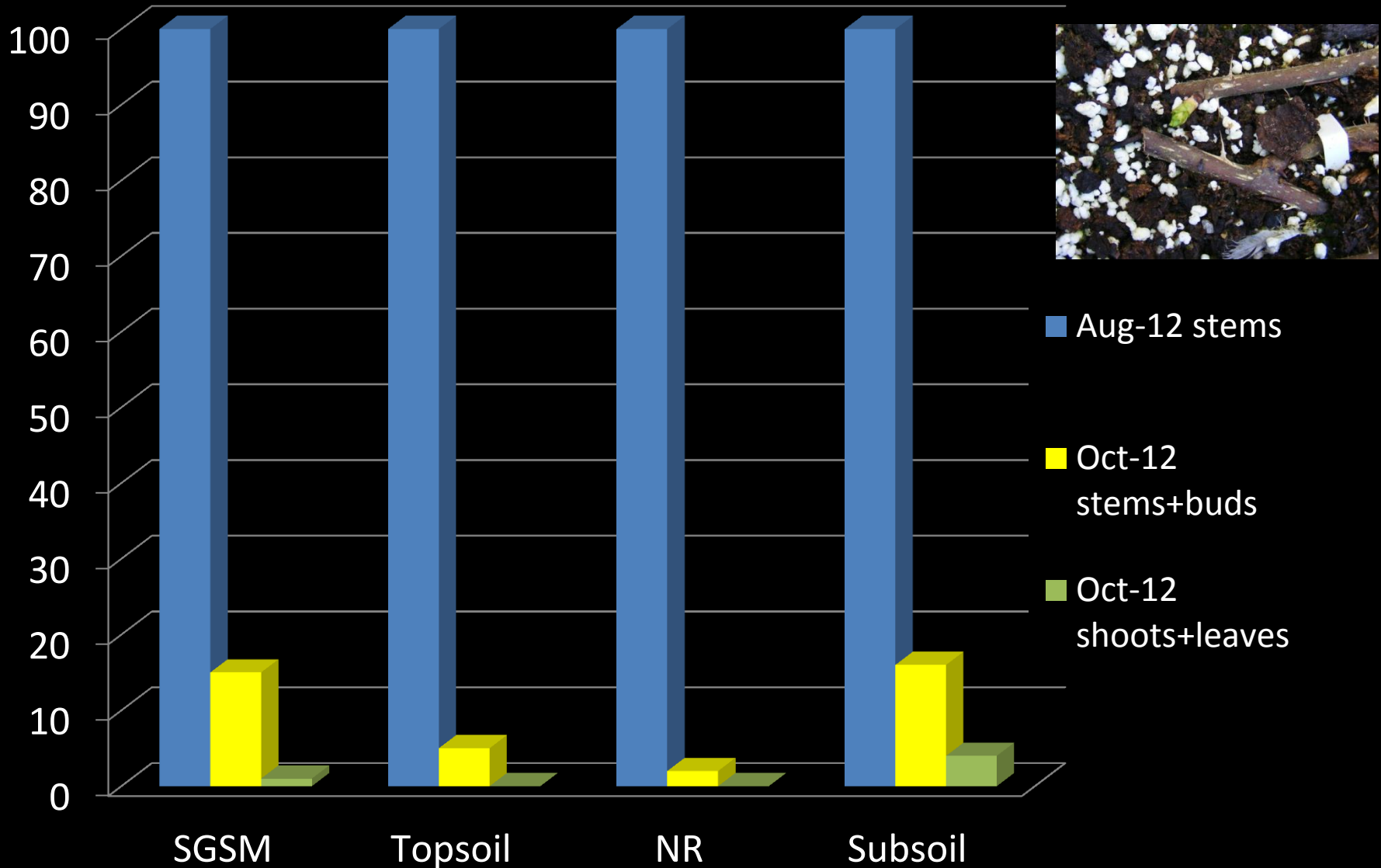
RR from Seed propagules



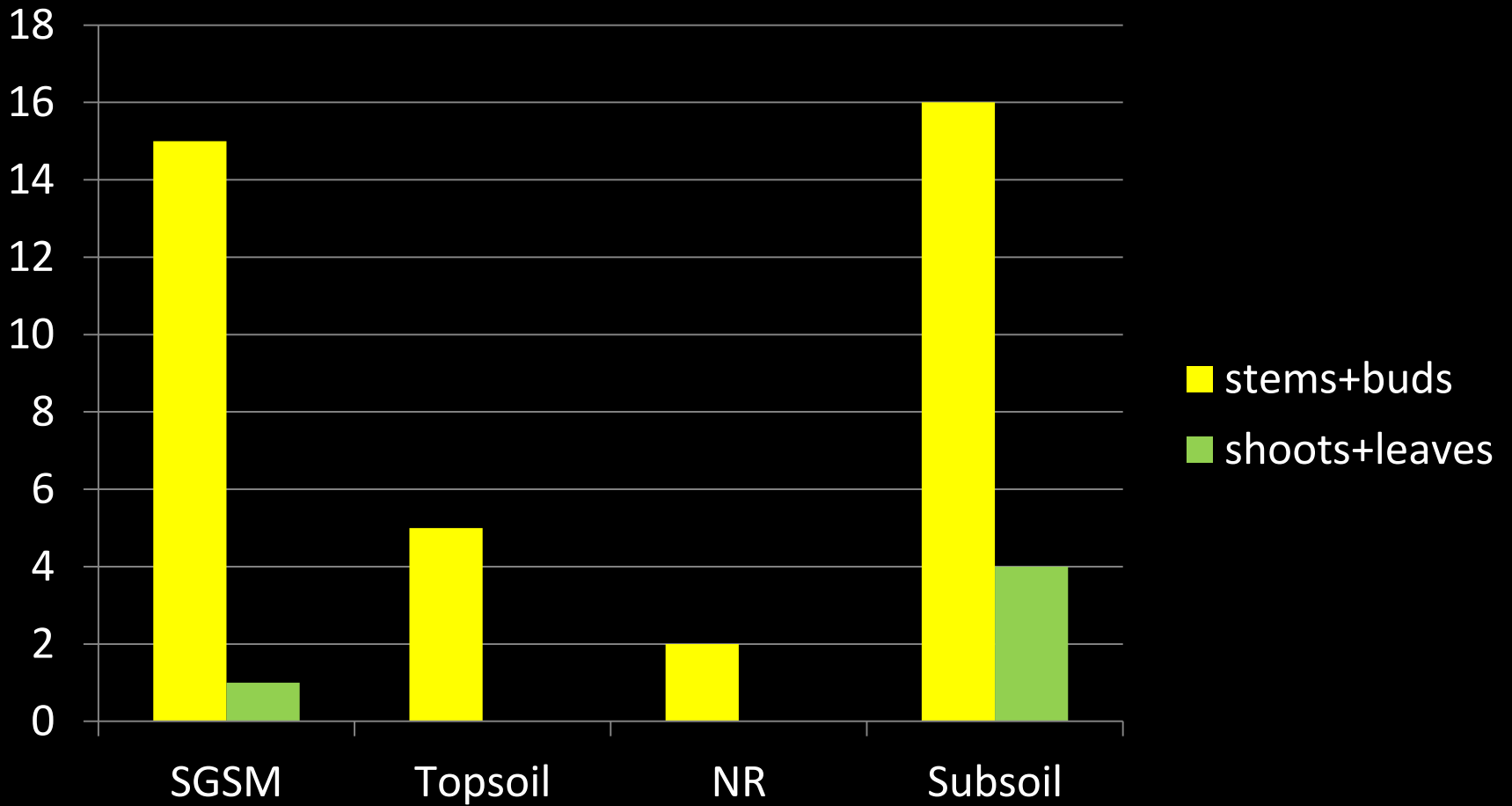
RR: no. of surviving propagules germinated from Seed



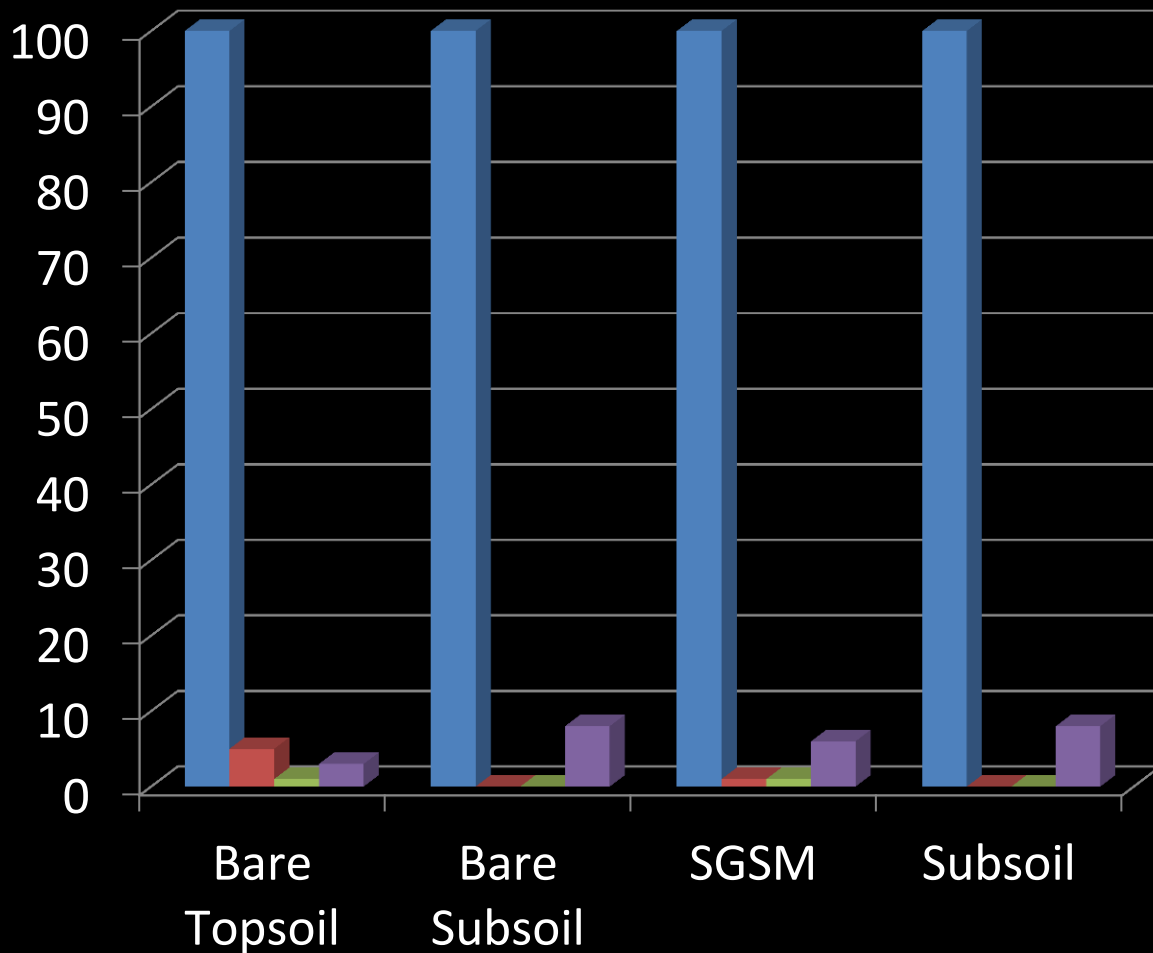
RR: Stems generating buds/shoots



RR: Stems buds/shoots by treatment



RR: Roots - no. of buds/shoots by treatment



■ root fragments
17 Sep

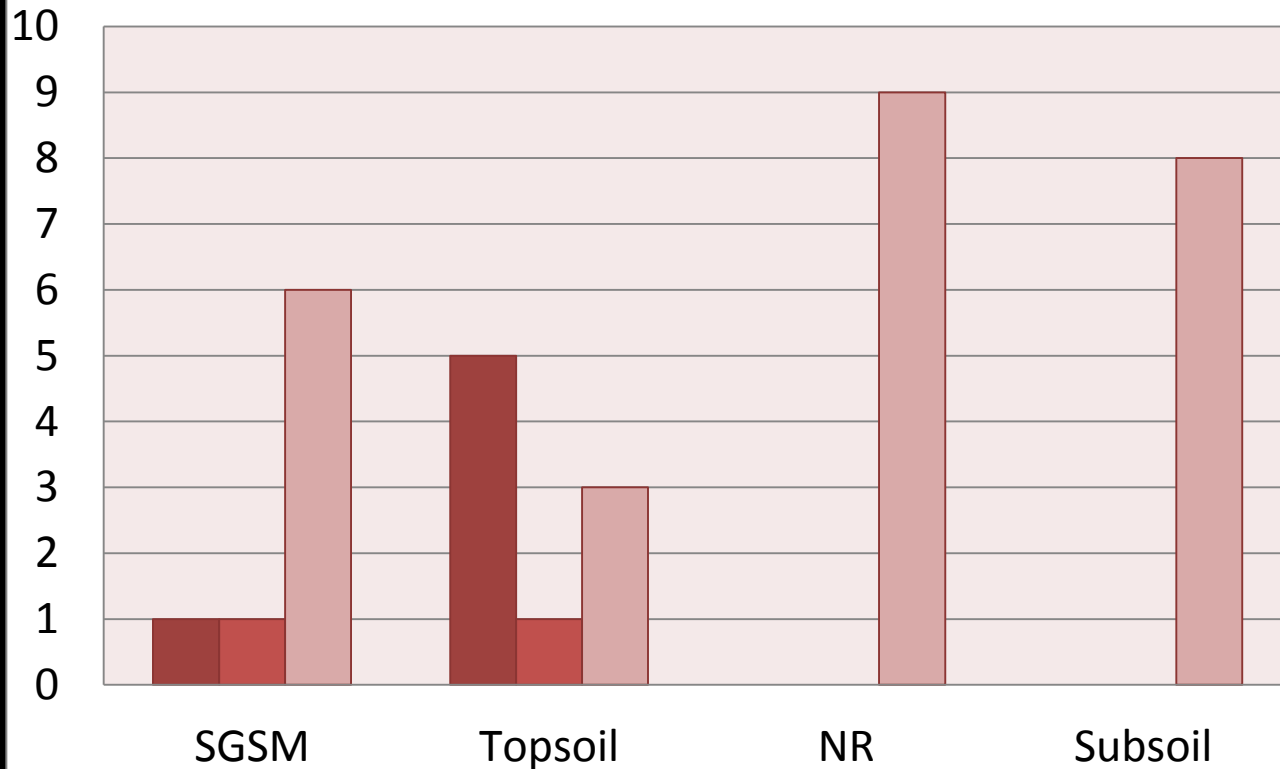
■ no.buds 13 Oct

■ no.shoots 13 Oct

■ no.shoots 11 May

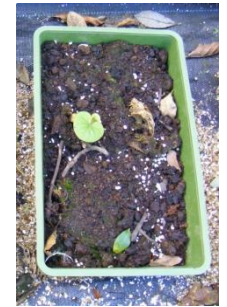
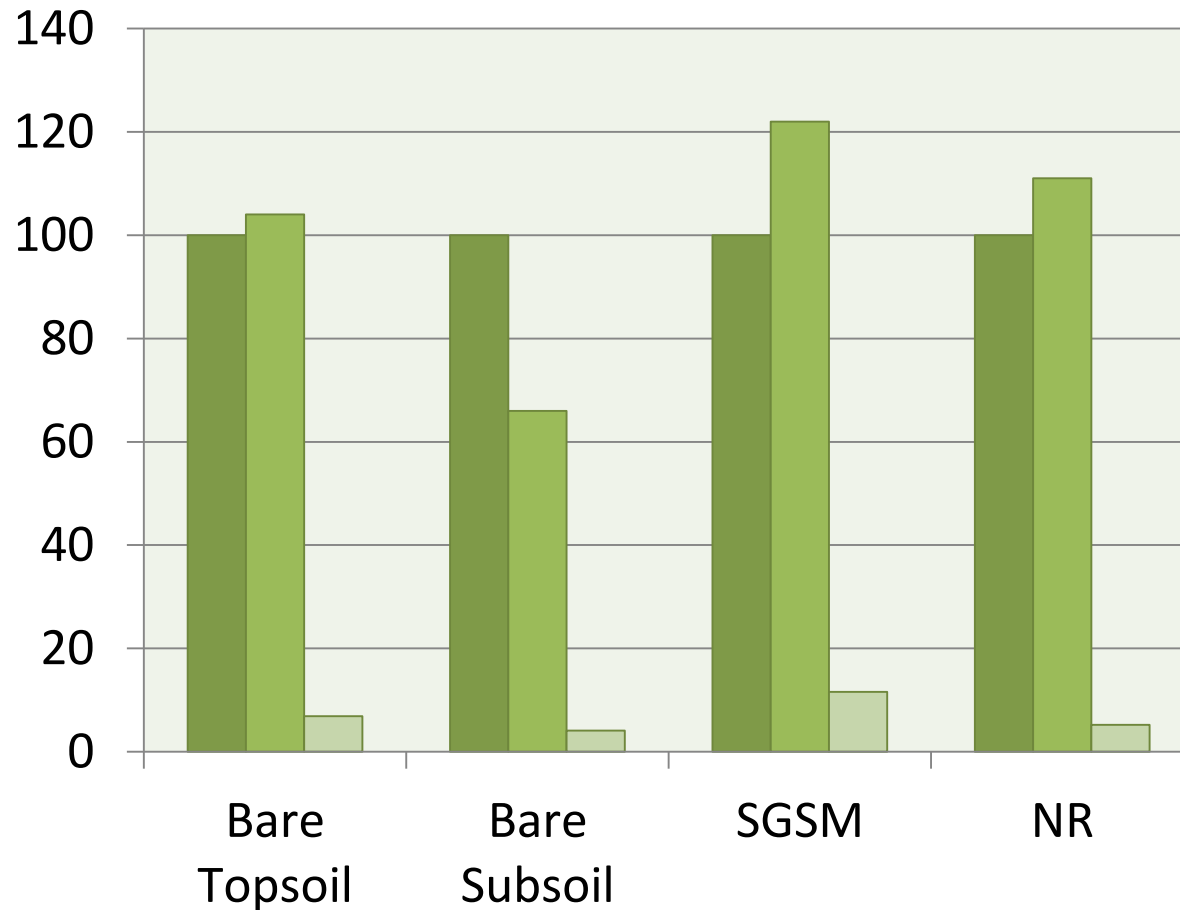


RR: Roots - no. of buds/shoots by treatment



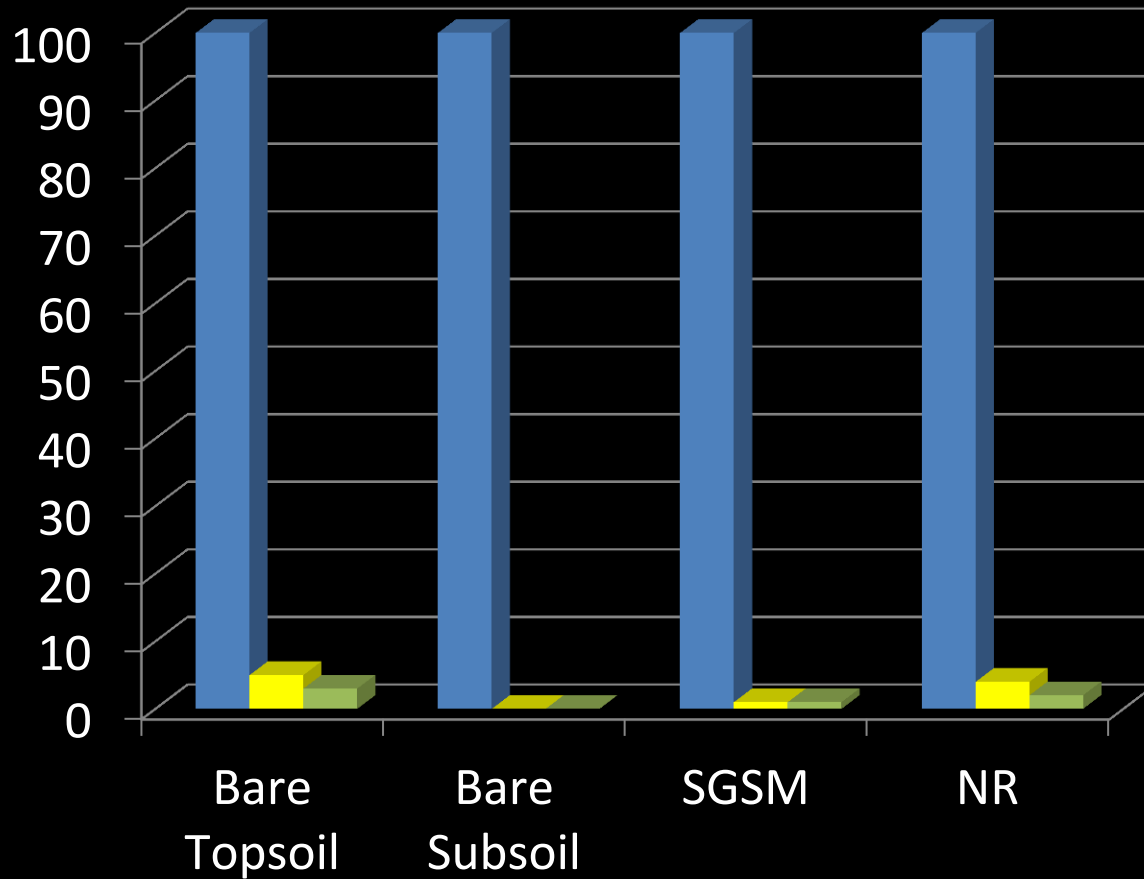
- no.buds 13 Oct
- no.shoots 13 Oct
- no.shoots 11 May

WH: Rhizomes generating shoots



- rhizome fragments
28 Aug
- tot.no.leaves
12 May
- mean.%.cover
12 May

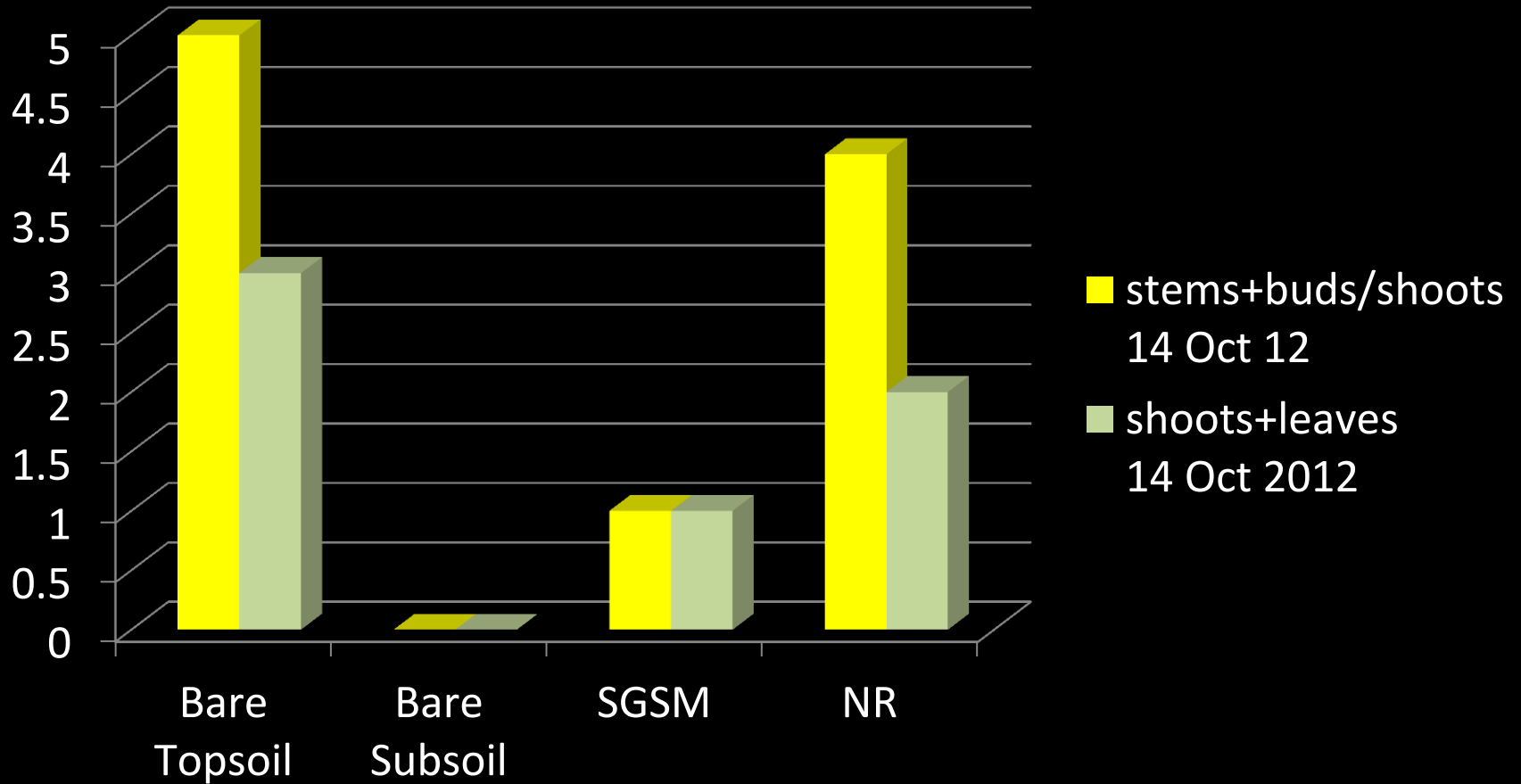
Budd: Stems generating buds/shoots



- stems
25 Aug 12
- stems+buds/shoots
14 Oct 12
- shoots+leaves
14 Oct 2012



Budd: Stems generating buds/shoots



Early Results

- Seed and stems only application on undisturbed plant communities, here least invasion success.
- No difference between pre- and post-guidelines overall
- The weather experienced may have had an effect

What does it all mean?

- In Summary...Prevention is better than cure
- Avoid disturbance of existing /adjacent plant communities
- Treat Early
- Review Vegetation Management
- Monitoring of Verges
- *More research!*

Thank you

