



**Centre for
Ecology & Hydrology**

NATURAL ENVIRONMENT RESEARCH COUNCIL



RINSE

Chemical Control of Aquatic Plants

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Reducing the Impact of
Non-native Species in Europe
www.rinse-europe.eu

“Investing in your future”

Crossborder cooperation programme 2007-2013 Part-financed by the European Union (European Regional Development Fund)

Why use herbicides?



- Cost effective
- Non Toxic, Non hazardous
- Targeted
- Quick and easy to apply
- Long term control
- Low risk of fragmentation
- Rapid die back

EFSA



- Directive No 1107/2009
 - <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:309:0001:0050:EN:PDF>
- New aquatic ecotoxicity guidelines
- Exclusion criteria if active substance has an effect on aquatic organisms, even if the intended target is an aquatic nuisance species...

Available Herbicides



- Glyphosate – broad spectrum
 - 92 Approved formulations of Glyphosate
- 2,4-D Amine – broad leaf
 - 2 Approved formulations of 2,4-D Amine
- Diquat, Terbutryn, Dichlobenil now banned

Which ones to use



- “Pro Biactive” formulations
 - Plants **absorb** glyphosate through their **leaves and other green parts**. From here, the glyphosate **moves** to the **growing points** of **shoots** and **roots**, where it **interferes with the enzymatic production of certain amino acids** that are essential for plant growth. This pathway **exists only in plants**, fungi and bacteria, so the **toxicity to animals is low**

When to use



- **AT THE RIGHT GROWTH STAGE**

- 2,4-D amine

- Active growth, early summer

- Glyphosate

- At end of active growth period, late summer, and autumn

Target Species



- Emergent reeds, rushes and grasses
- Water Lilies
- Floating Leaved Plants
 - (except Duckweeds)
- NO submerged weeds
- NO Algae



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***Myriophyllum aquaticum* treated with glyphosate**



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7 days later

Optimum timing



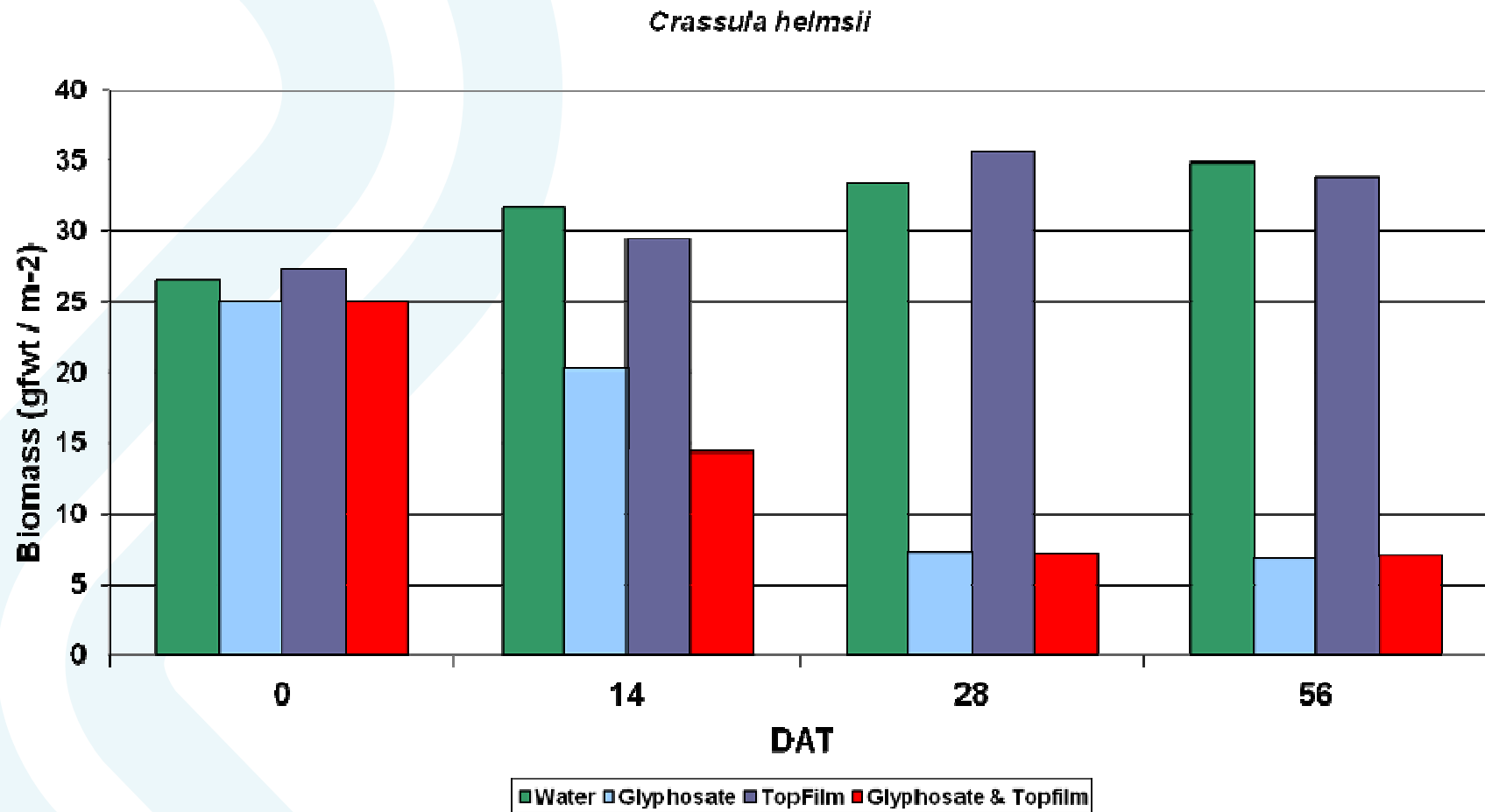
- Control of invasive aquatic alien species
- Experimental evidence
 - Timing, dose, response, formulations, adjuvants

Experiment



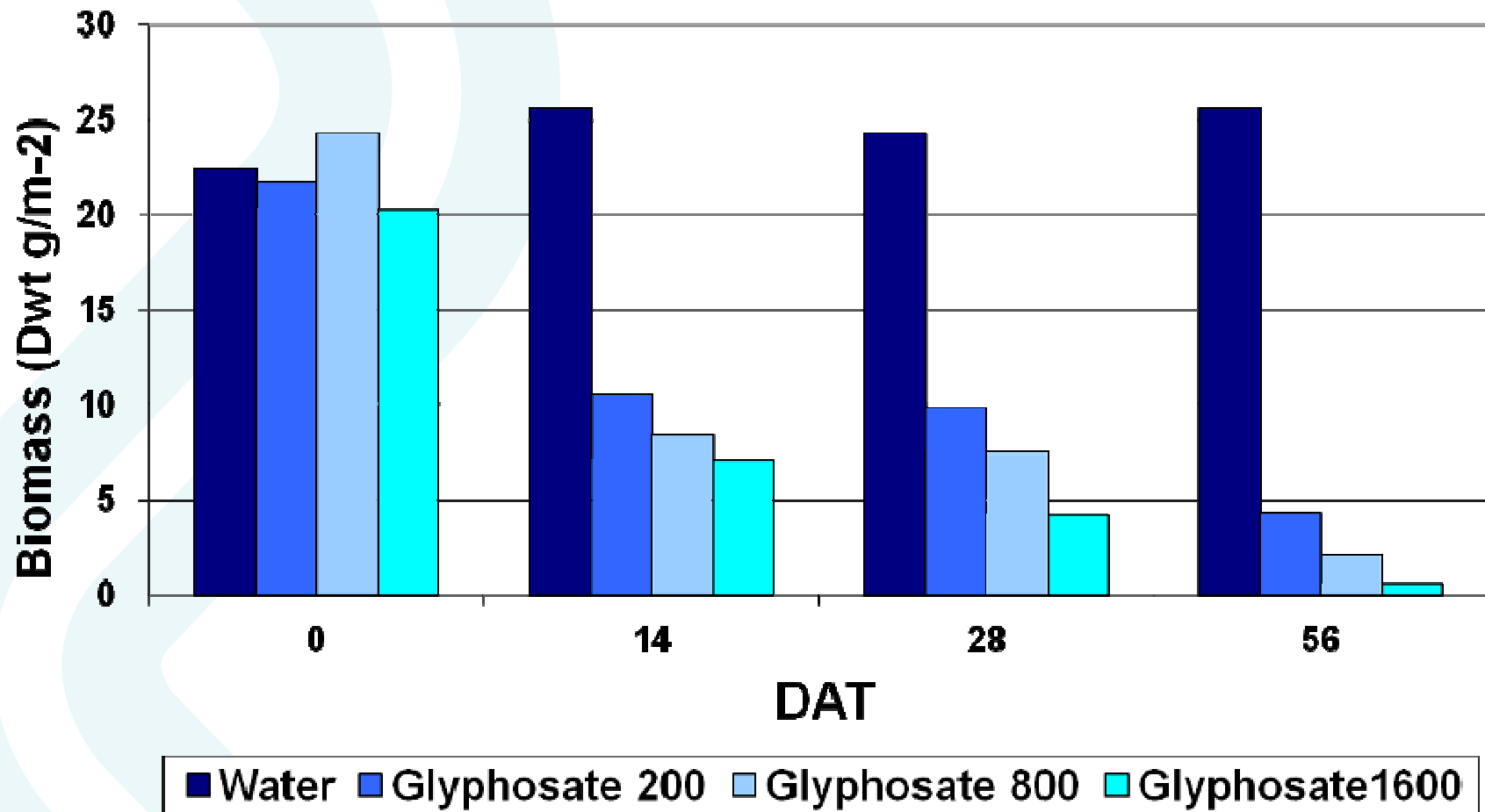
- Application Mid July, fully grown in tanks
- Roundup pro Biactive, 5 L/Ha,
- TopFilm, 1.2 L/Ha
- Observations every 7 days

The Use of Adjuvants

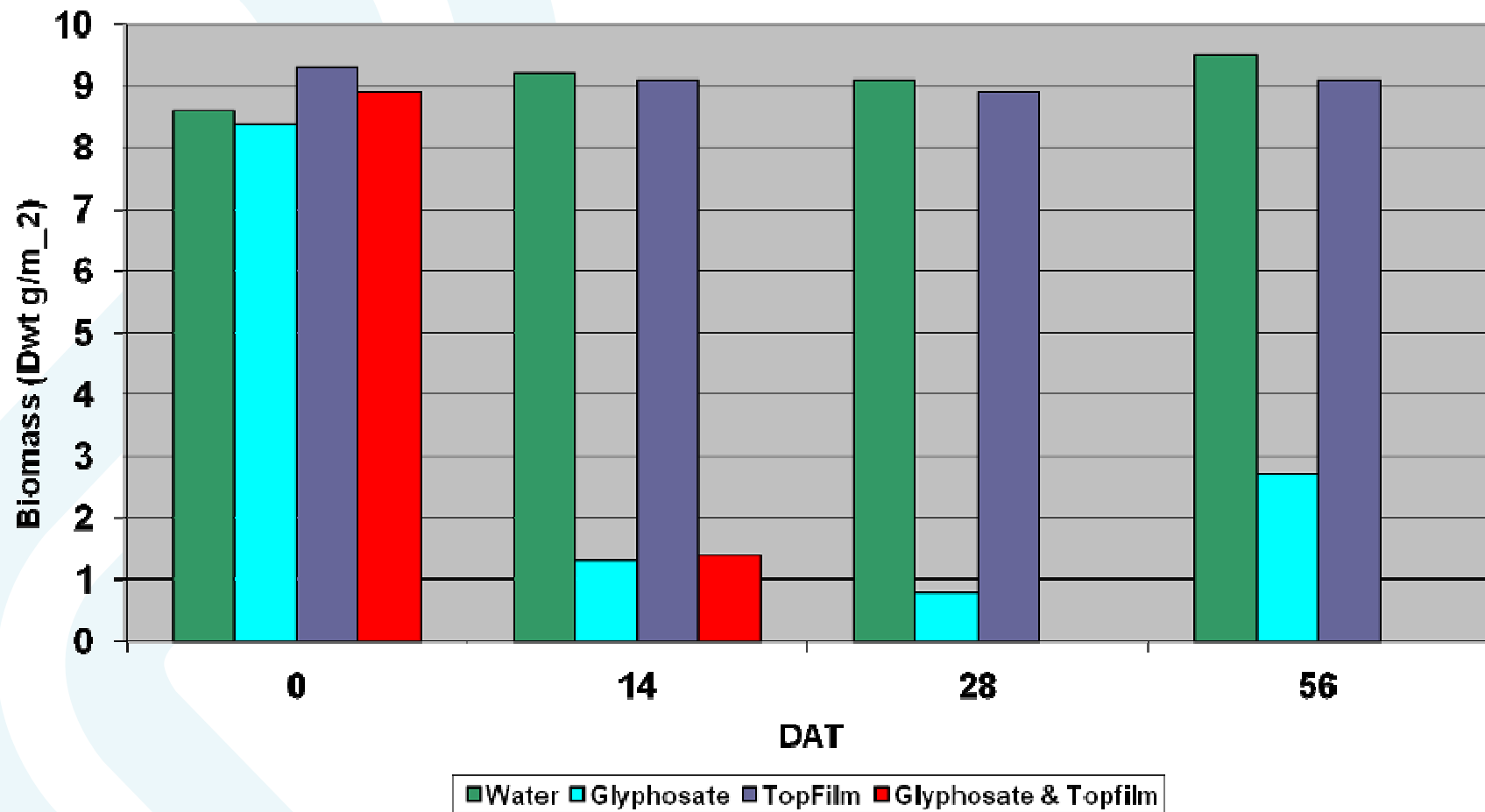


Effect of Water Volume

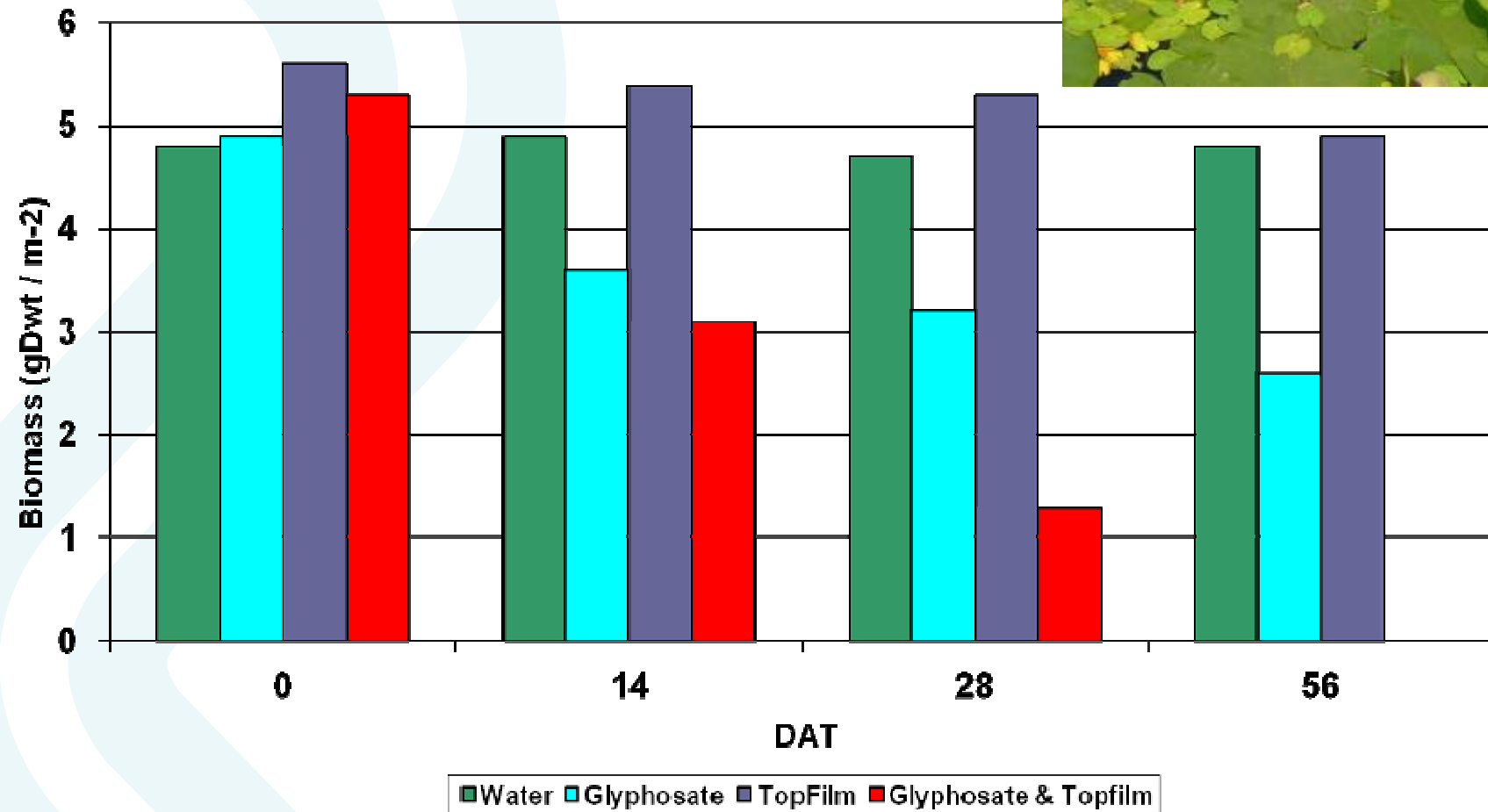
Crassula helmsii



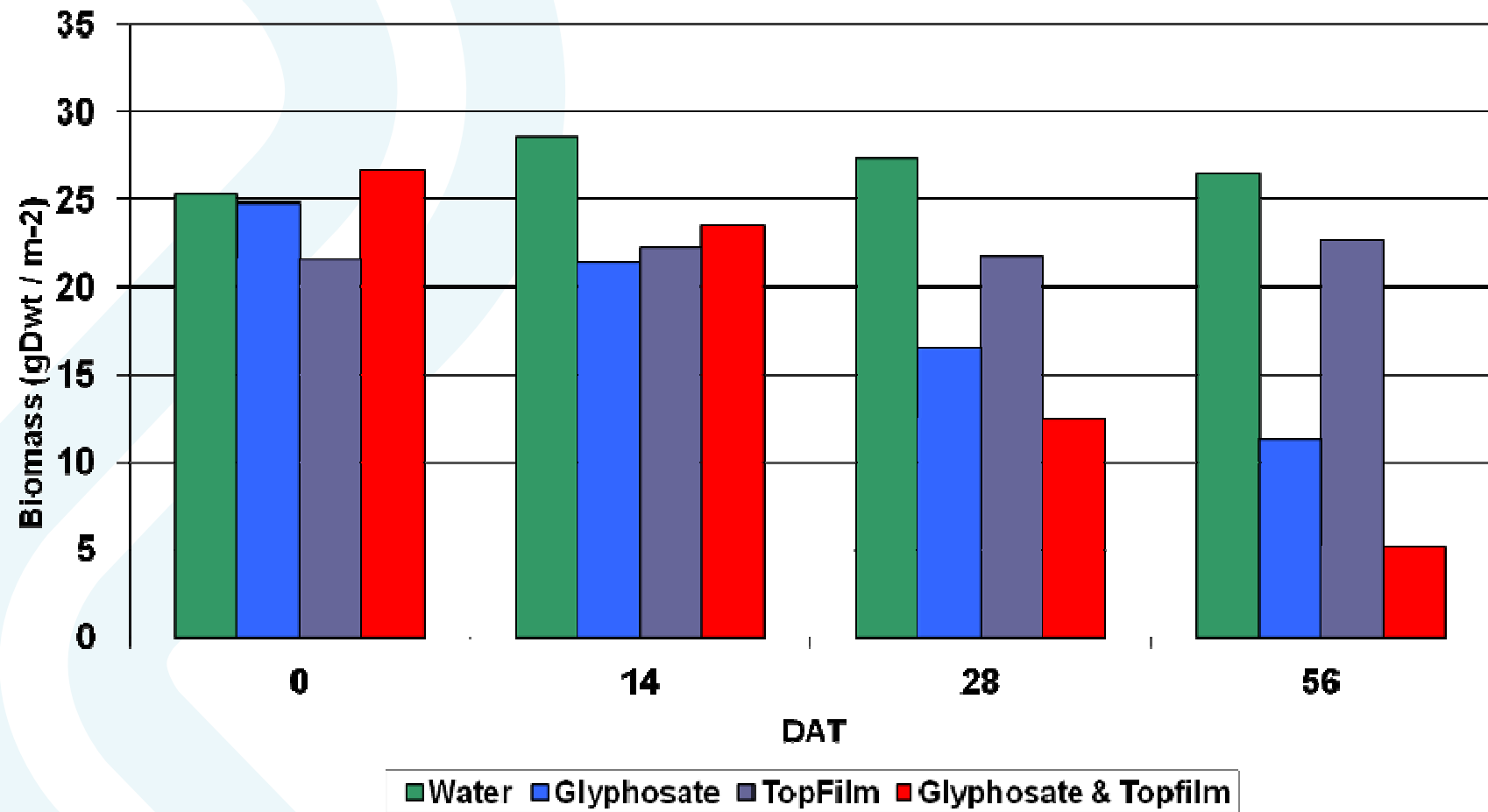
Potamogeton natans



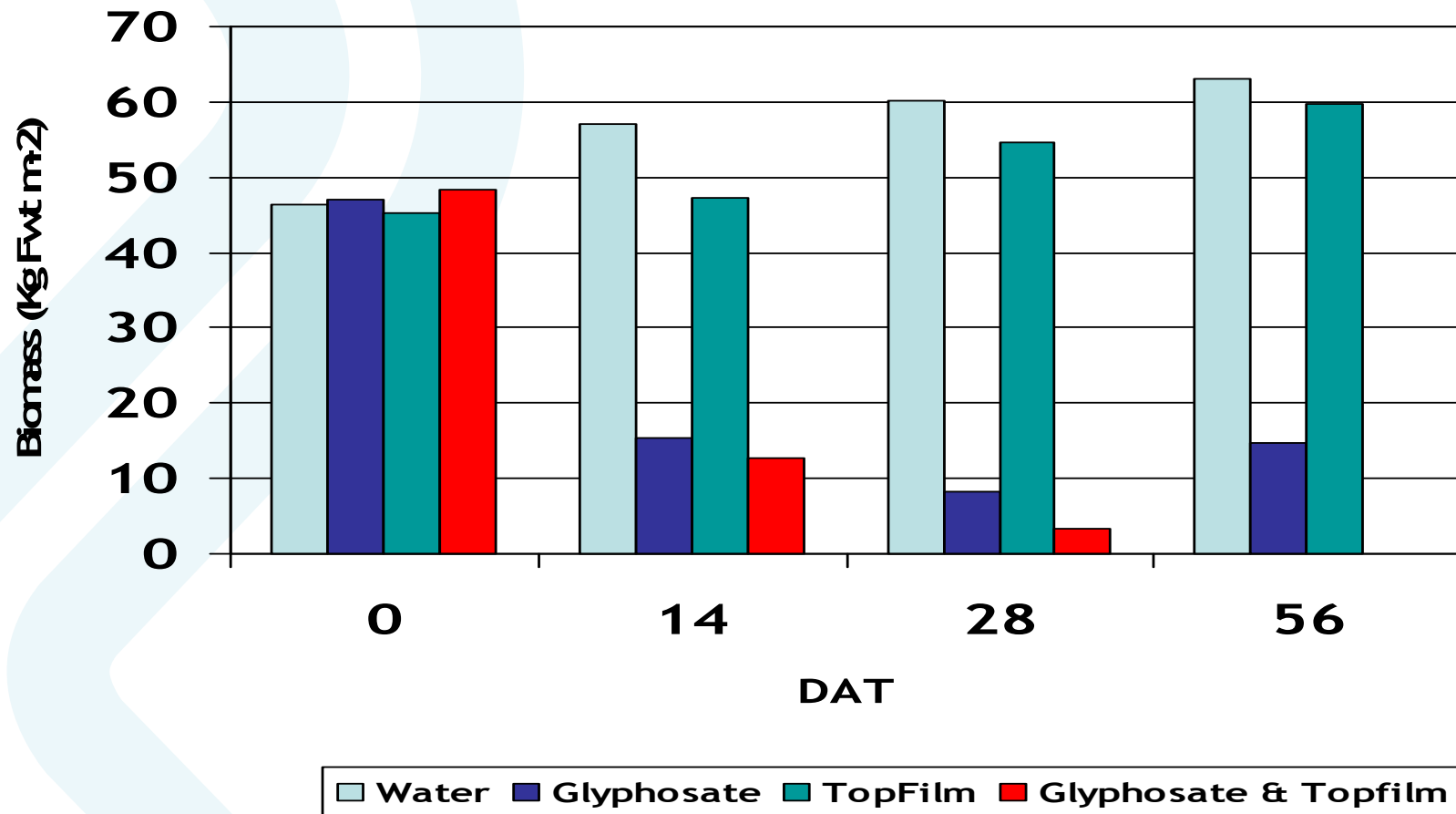
Nymphoides peltata



Ludwigia grandiflora



H. ranunculoides



Bankside weeds



- **Japanese Knotweed**
 - Glyphosate in Autumn when flowering
 - Picloram any time of year
 - Stem injection late summer





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Dead

Giant Hogweed

- Glyphosate early in season when plants are no more than 1 m high



Lysichiton camtschatcensis

2,4-D amine



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L. americanus

- Glyphosate



Summary

- Safe
- Selective
- Effective
- Timing
- Long Lasting
- Follow-Up
- No Fragmentation

