

Removal of Weeds from Seedline in Vegetable Production

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- Typically 80% of a 40-inch wide bed can be effectively cultivated.
- The fight with weeds occurs in the uncultivated seedline

Ideas for Improving the Efficiency of Cultivation

Precision Guidance of Cultivators

Guided by the Operator

Effective but Slow and Tedious

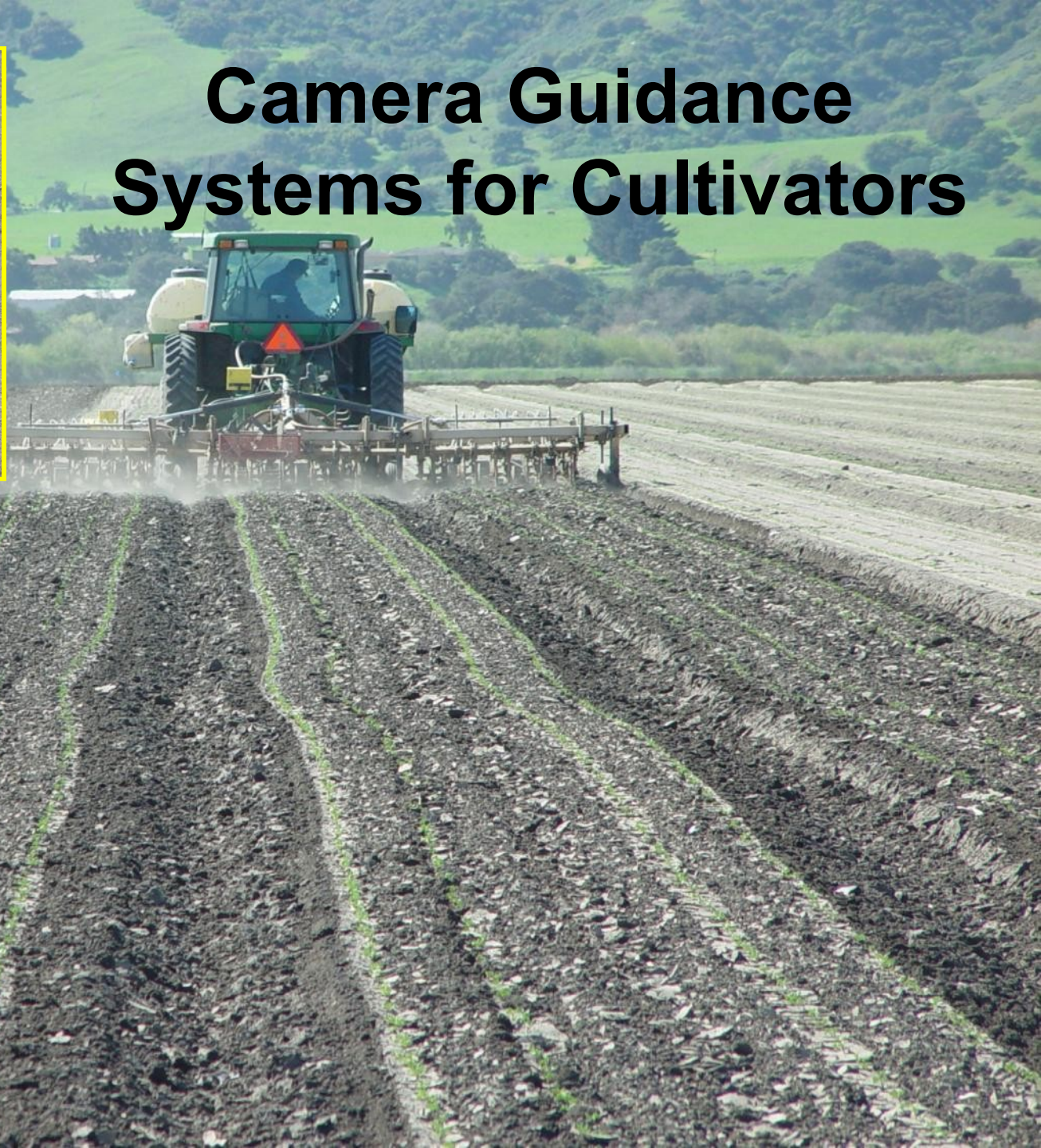


Old Technology



Modern Version

Camera Guidance Systems for Cultivators



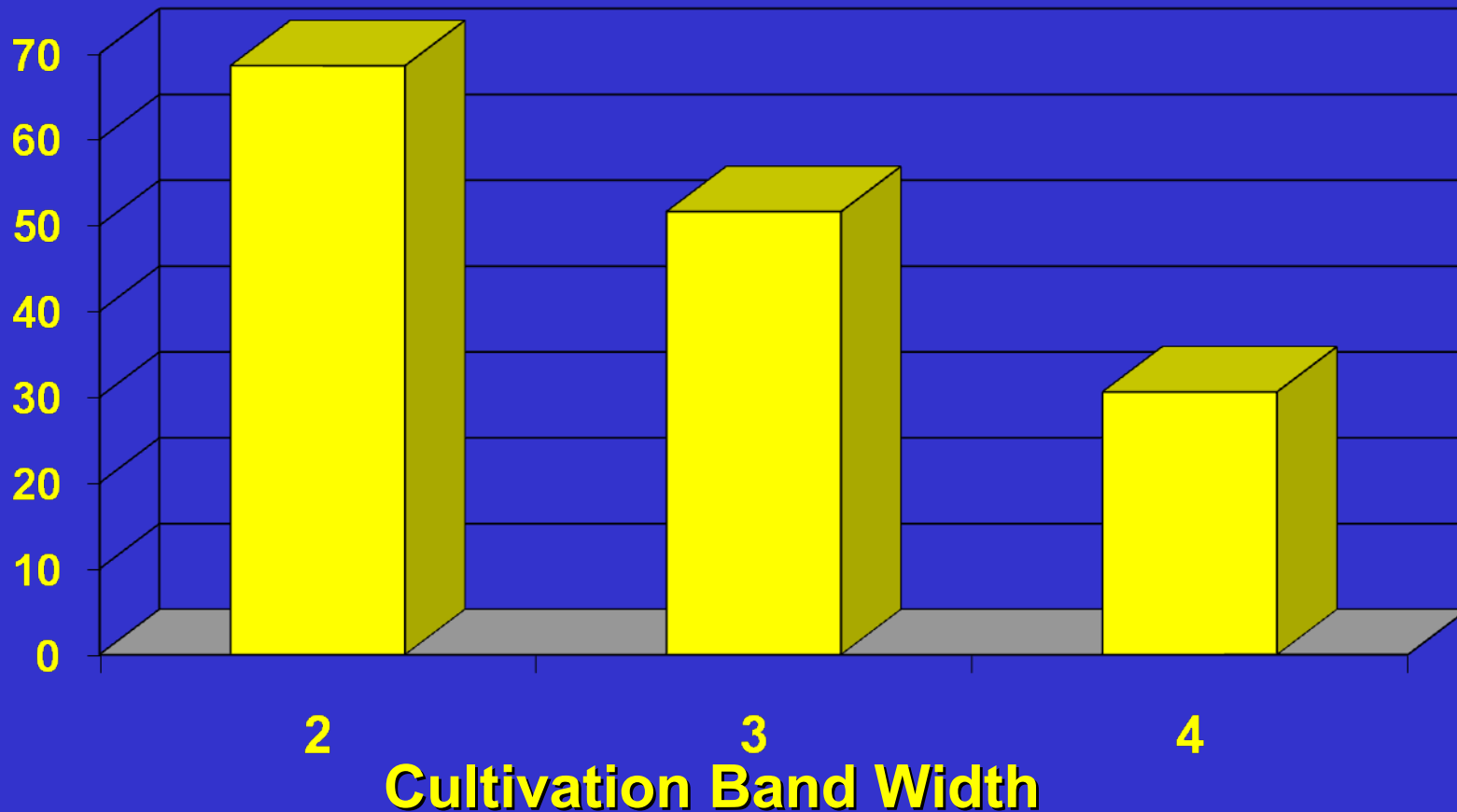


2 inch band

4 inch band

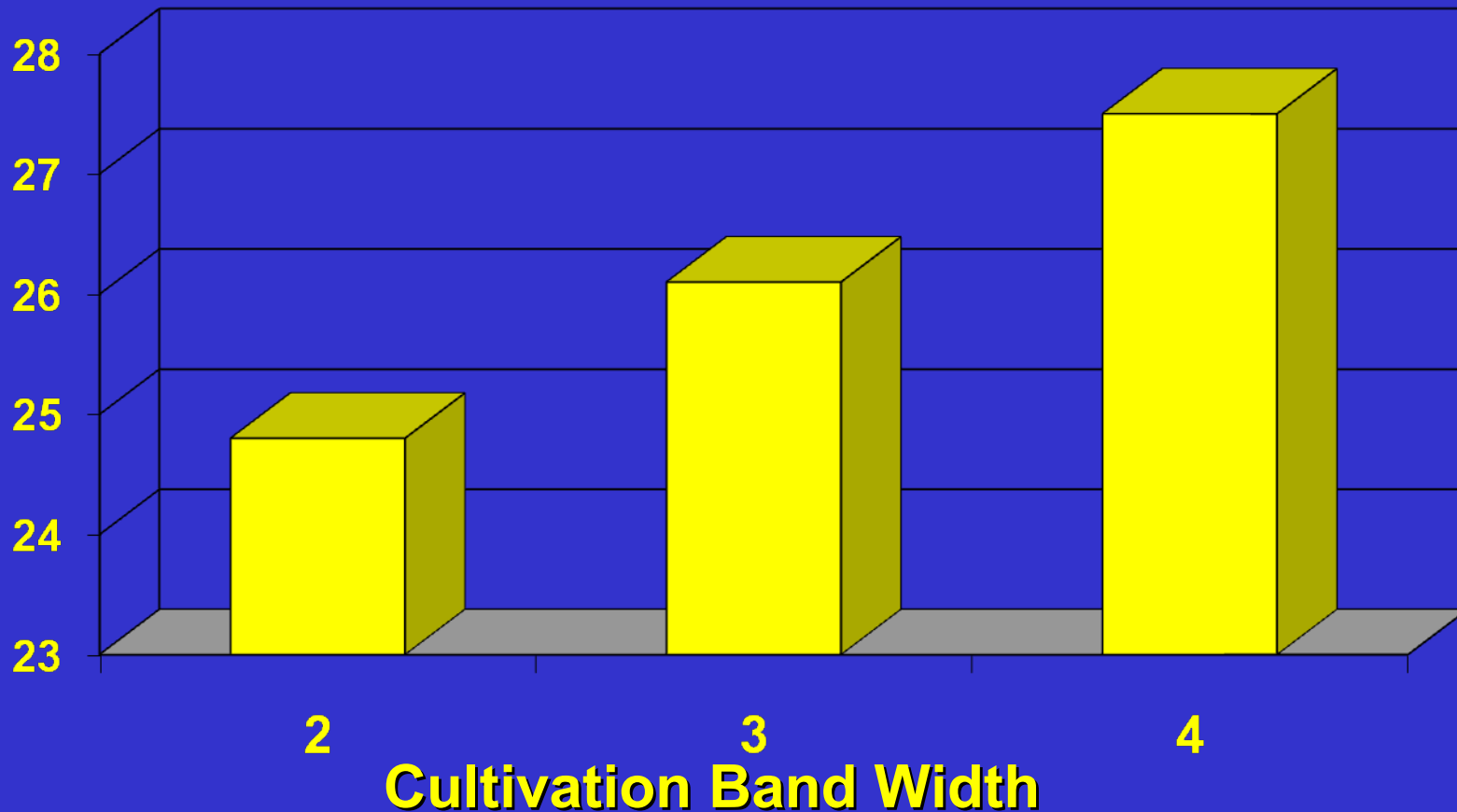
Percent of Weeds Controlled at Different Cultivation Band Widths

2005 Lettuce Trial No. 1



Hours Per Acre to Weed Different Cultivation Band Widths

2005 Lettuce Trial No. 1



Close Cultivation

- **The EcoDan and Robocrop guidance systems allow close cultivation without reducing speed**
- **Close cultivation is able to remove a greater percentage of weeds and reduce weeding time accordingly**



**Removing
Weeds from
The Seedline**

- **Removal of weeds from the seedline is one of the great challenges in vegetable production**
- **Many ideas have been tried over the years, but small, direct-seeded crops such as lettuce and broccoli are challenging because the seedlings are delicate and relatively slow growing**

Removal of Weeds in the Seedline

- **Research efforts by Dave Slaughter at UCD is developing a system that uses a camera and computer to recognize weeds which are removed using various technologies**
- **Commercial units – Tillet and Hague which uses a spinning disc to remove weeds from the seedline while safeguarding the crop**
 - **May also be used for thinning/weeding**



Lower Tech Ideas for Removing Weeds from the Seedline

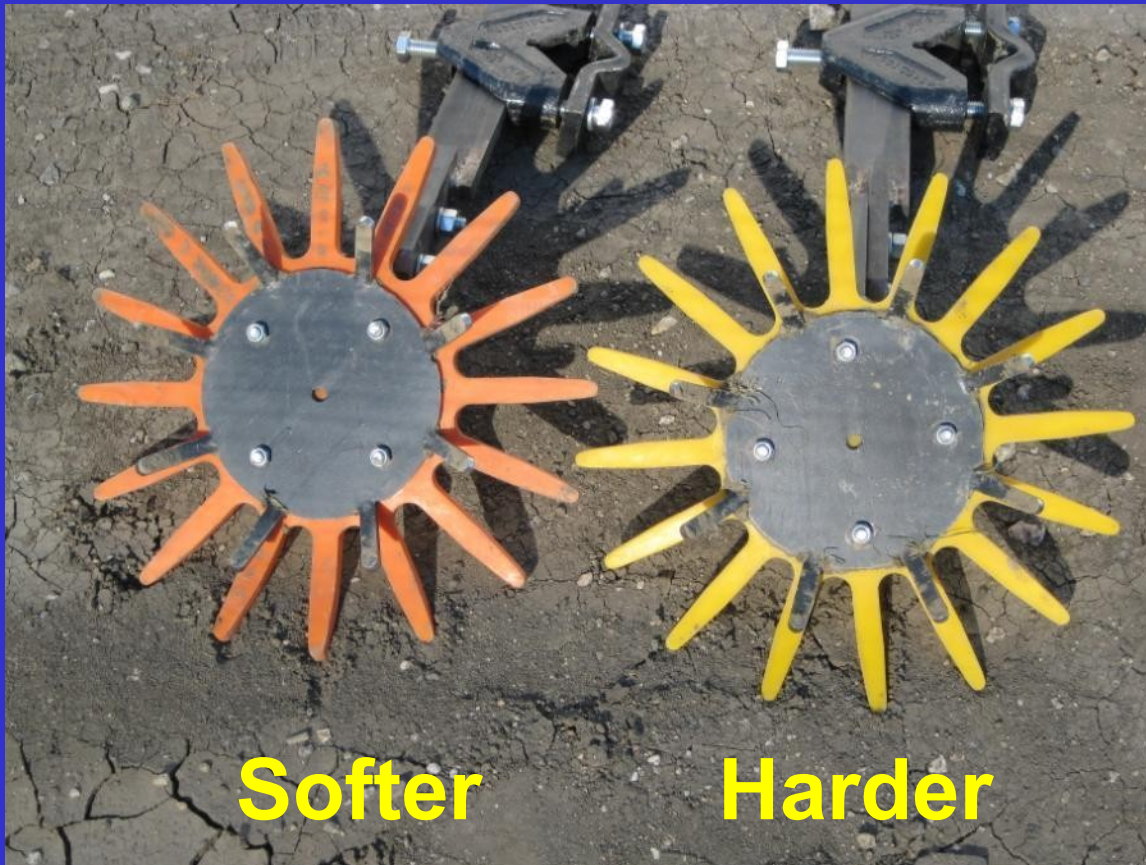
- **In Europe where transplanting of vegetables is commonly used, there is wider use of implements that are capable of removing weeds from the seedline**
- **We tested two of these implements:**
 - **Finger Weeder**
 - **Torsion Weeder**

Finger Weeder Background

- This idea originally came from the US – was invented by the Buddingh Company, Michigan
- The idea was taken to Europe and further developed and refined (now produced by three companies)
- The Europeans claim their designs can operate at higher speed

Finger Weeders

Two sizes and two levels of hardness



Kress Co, Germany









Torsion Weeder

Frato Corp, Netherlands



**Come in Different Sizes
7 & 9 mm**





2008 On-Farm Trials



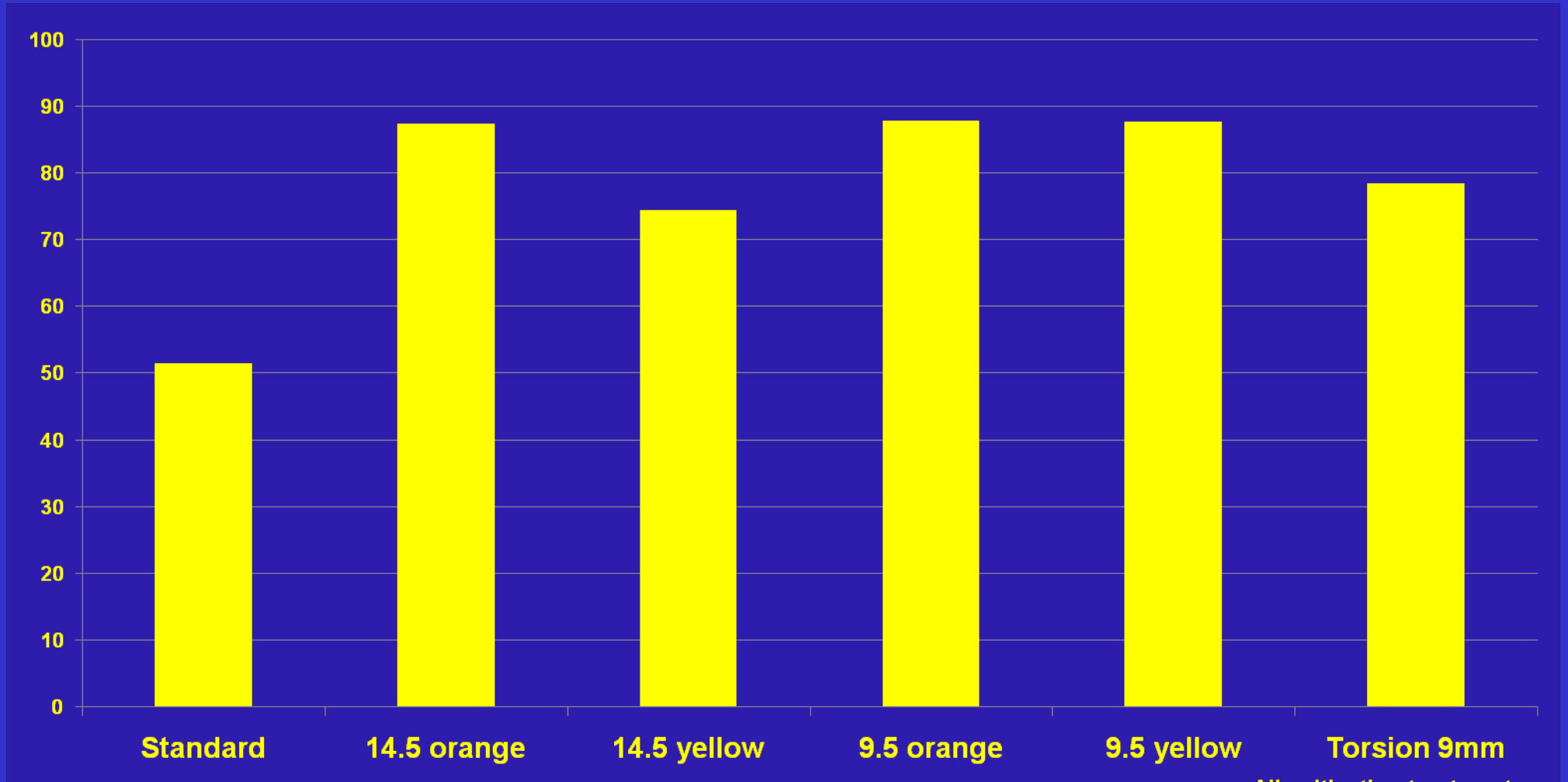
Transplanted Lettuce Trial No. 1



Transplanted Lettuce Trial No. 1

Percent Removal of Weeds

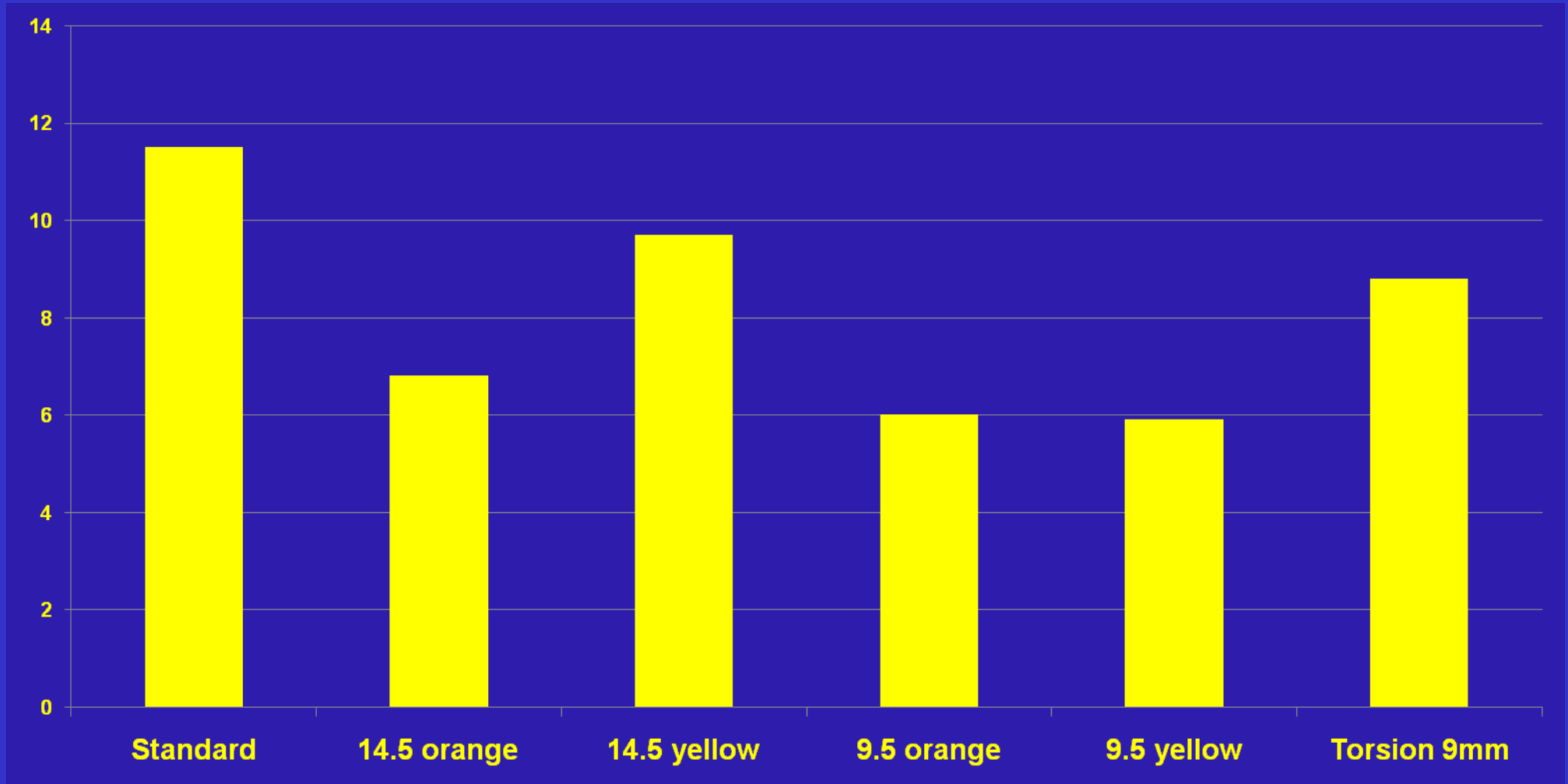
Small Nettle Dominant Weed



All cultivation treatments
Improved percent removal

Transplanted Lettuce Trial No. 1

Weeding Time hrs/A



Standard Cultivation



Finger Weeder



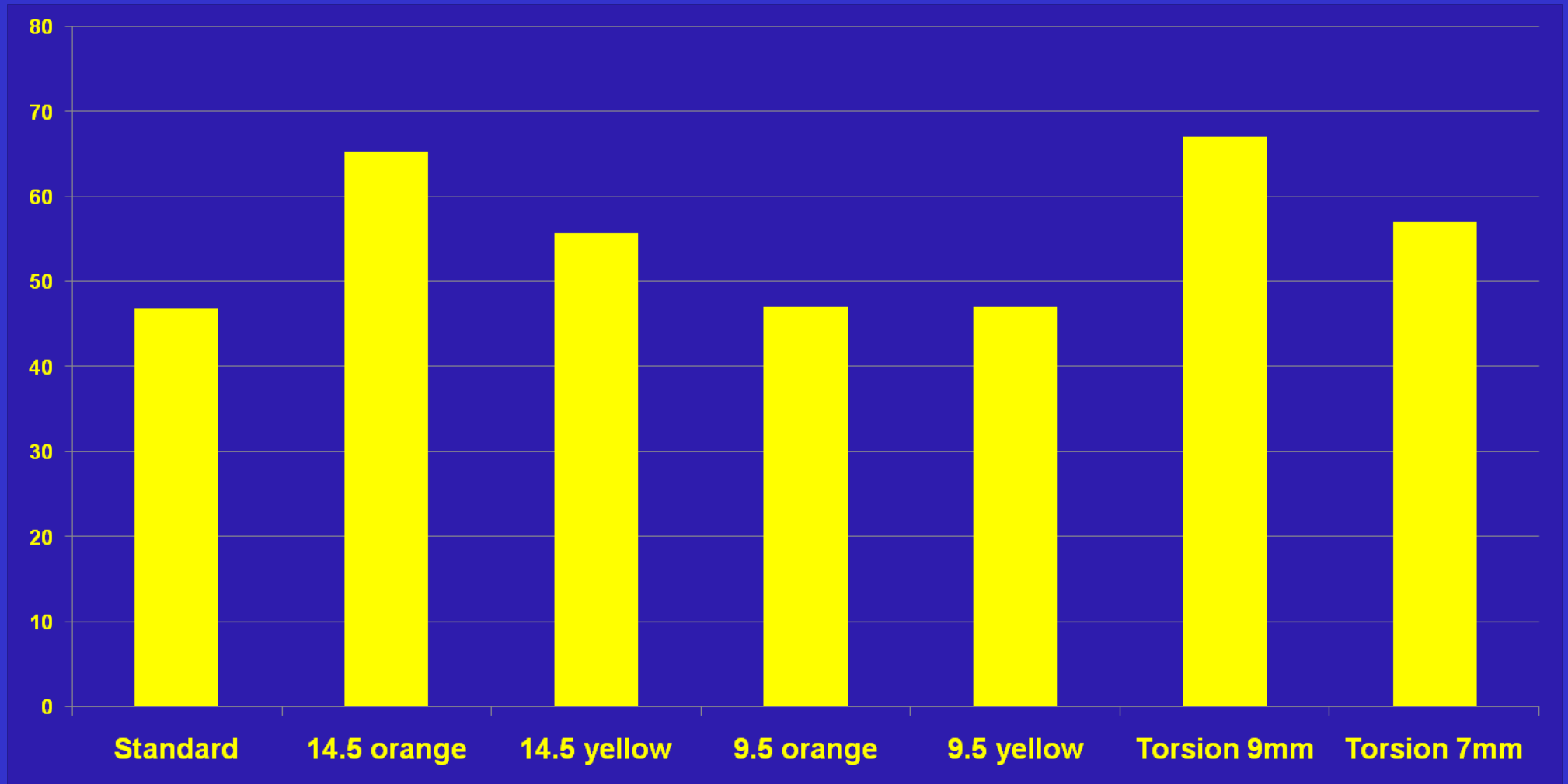
Transplanted Lettuce Trial No. 2



Transplanted Lettuce Trial No. 2

Percent Removal of Weeds*

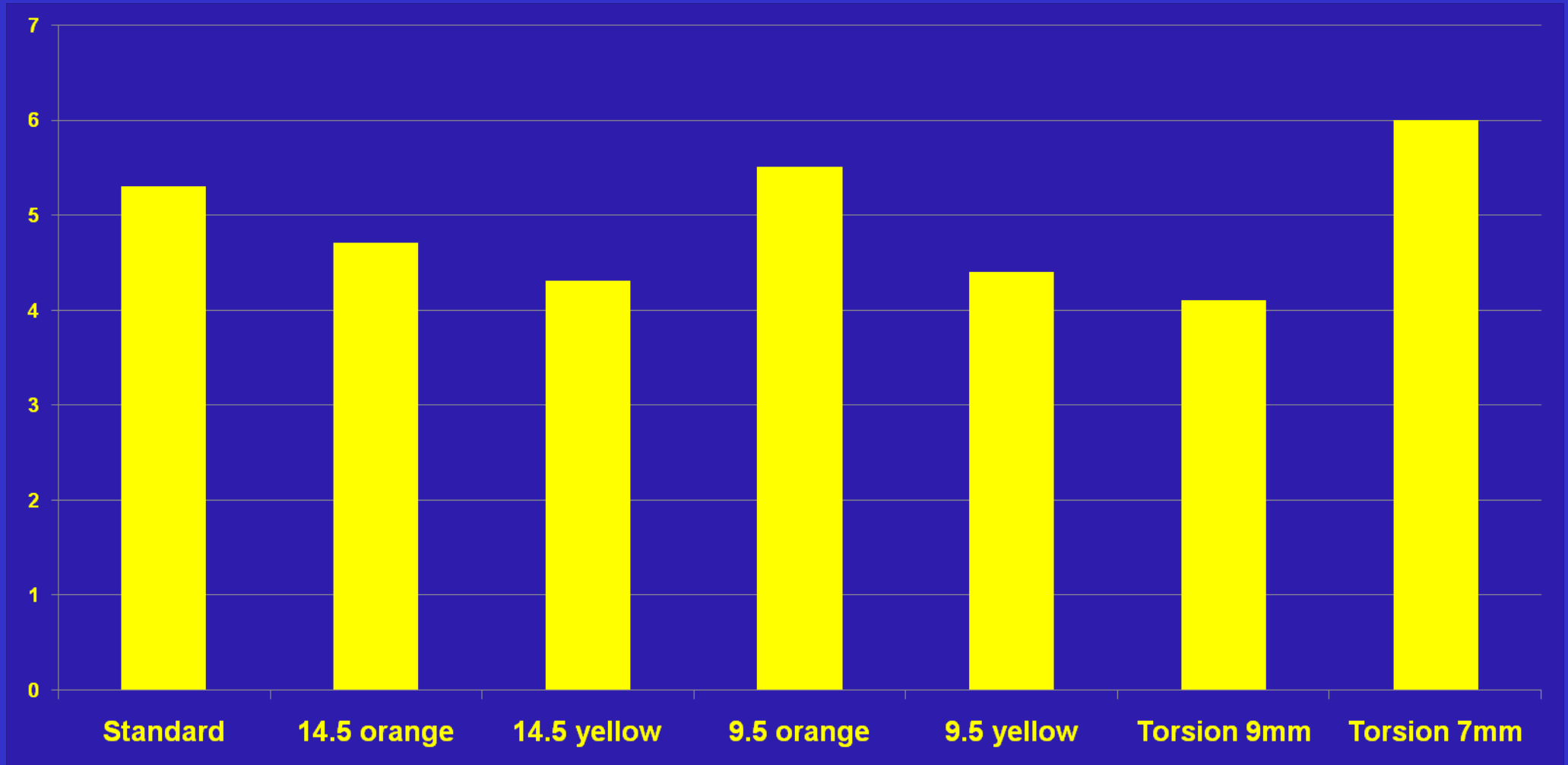
Malva Dominant Weed



* No significant differences

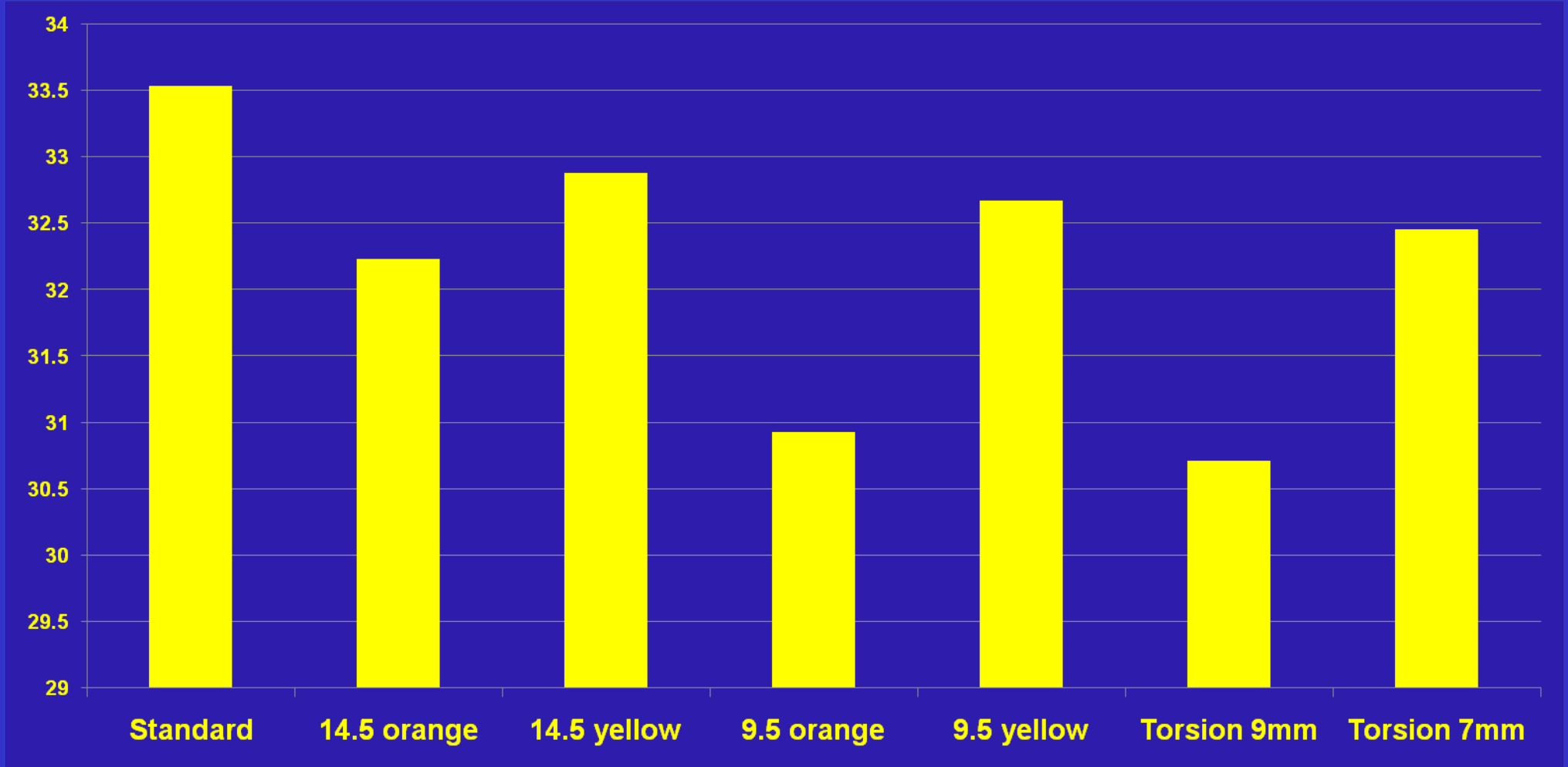
Transplanted Lettuce Trial No. 2

Weeding Time hrs/A



Transplanted Lettuce Trial No. 2

Heads/A in 1000's





**Adjustment of the units
is critical for crop safety**



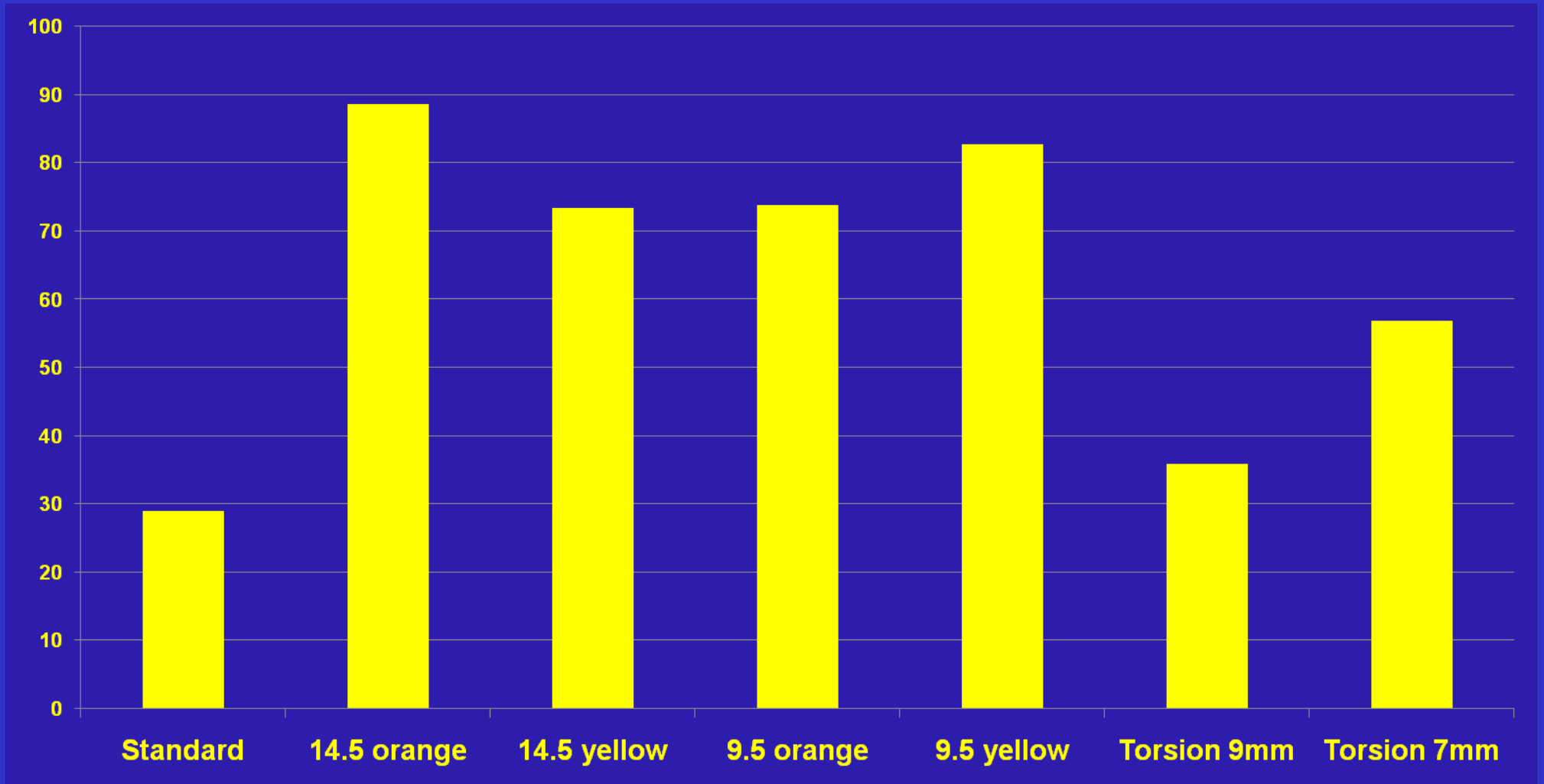
2008 Leek Cultivation Trial



Transplanted Leek Trial

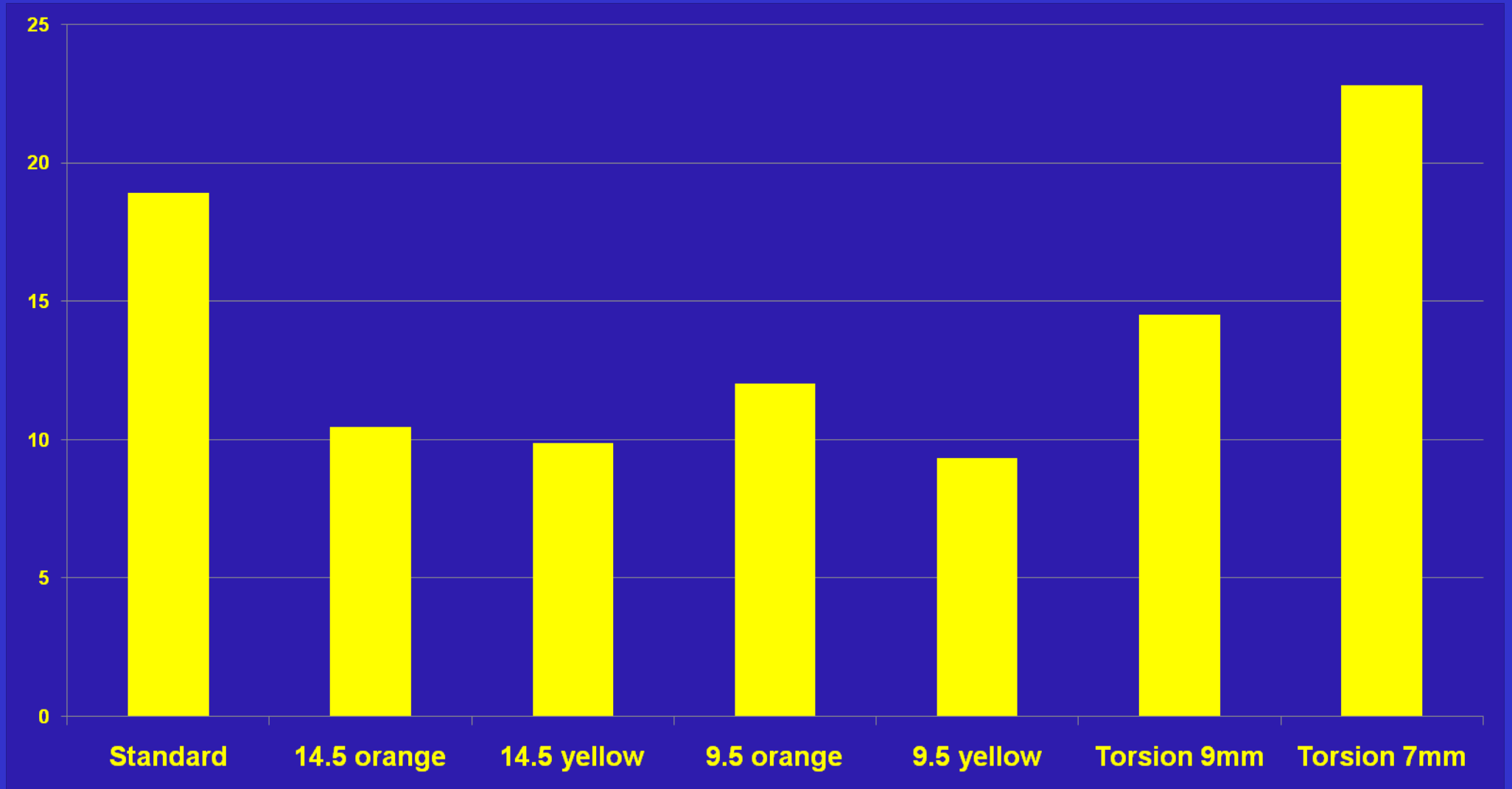
Percent Removal of Weeds

Nettle, Pig Weed and Malva Dominant Weeds



Transplanted Leek Trial

Weeding Time hrs/A







Standard

9.5" yellow





Summary

- **Finger and torsion weeders show promise for transplanted crops**
- **They can provide crop safety and effective weed control**
- **Cultivations have to be done when the crop is firmly anchored**
- **They are most effective when the weeds are at the cotyledon to 1st true leaf stage**
- **When done right, they can reduce subsequent hand weeding operations**

Acknowledgements

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