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Effects of Light, Nitrogen and Propagative Sources on *Cirsium arvense* (L.) scop.

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Abstract

Cirsium arvense (Canada thistle or Creeping thistle) is a noxious perennial broad-leaved weed in the Composite family, propagated by adventitious root and seed. It has an extensive, spreading root system and infests non-intensive arable farming systems mainly in Europe, North America and New Zealand. Understanding a response of plant to the environmental factors will permit integration of control methods and result in improved weed management in organic farming systems.

The concrete frame experiment under field conditions was conducted to determine the effects of light (full light and 85–95 % of shade), nitrogen (0 and 100 kg N/ha) and propagative sources (seed and root) on the growth of *Cirsium arvense*. Light was a main factor for *Cirsium arvense* growth. Statistical analysis showed very significant effects of light on plant height, biomass, sprout number, root diameter and survival rate. Constant shade reduced 58.6 % of height and 99.5 % of biomass. However, the transplanted plants were tolerant to shade at the establishment and early development. This plasticity appears to explain its persistence in the temperate zone. Nitrogen was not a limiting factor for early development of individual *Cirsium arvense* which responded to light more than to nitrogen. The plants grown from seeds were much larger than those from root fragments. The contribution of sexual propagation to the survival of this species should not be underestimated. The management of this weed relying on shade would be through using tall crop and shading cropping system. Nitrogen fertilizer would also be helpful to crop by suppressing this weed.

Keywords: *Cirsium arvense*, light, nitrogen, propagative sources