



Weeds and weed management in lettuce

F. Tei*, A. Cirujeda, A. Dobrzański, R. J. Froud-Williams, H. Mennan, R. Neuweiler, E. Pannacci, J. Qasem, F. Rocha, A. Simončič, A. Verschwele, R. van der Weide, C. Zaragoza

* Dept. of Agricultural and Environmental Sciences, University of Perugia, Italy - f.tei@unipg.it

Objective

Information about key weeds, new weeds or species that have recently become problematic, effect of competition, weed management programmes in integrated and organic production, approved herbicides and those currently undergoing registration for use in lettuce grown in Germany (D), Italy (I), Jordan (HKJ), The Netherlands (NL), Poland (PL), Portugal (P), Slovenia (SLO), Spain (E), Switzerland (CH), Turkey (TR) and United Kingdom (UK) was collected.

Lettuces in surveyed countries

Country	ha
Spain	37500
Turkey	20000
Italy	18000
Germany	12500
United Kingdom	7000
Jordan	1900
Switzerland	1700
The Netherlands	1300
Poland	600
Slovenia	350



Although the majority of the lettuce crop is grown as an outdoor spring-summer crop (see table above), early and late productions are obtained by non-woven materials (fleece), clear/white plastic mulch, row covers and greenhouse cultivations to satisfy year-round consumption.

Black polyethylene and black biodegradable plastic (Mater-Bi) mulching are usually preferred where weed control is a priority in comparison to yield earliness. Lettuces are mainly transplanted as modules, but may be also direct-drilled.

Weeds

Key weeds

Weeds that are most problematic in lettuce are those that are taxonomically related and not controlled by herbicides, in particular, *Galinsoga* spp., *Anthemis* spp., *Matricaria* spp., *Senecio vulgaris* and *Sonchus oleraceus*.

However, *Capsella bursa-pastoris*, *Diplotaxis* spp., *Sinapis arvensis*, *Thlaspi arvense*, *Lamium* spp., *Fumaria officinalis*, *Papaver rhoeas*, *Veronica* spp., *Viola arvensis*, *Stellaria media*, *Urtica urens*, *Chenopodium* spp. and *Poa annua* may also be key weeds in early cultivations, whilst *Amaranthus* spp., *Polygonum* spp., *Portulaca oleracea*, *Digitaria sanguinalis* and *Echinochloa crus-galli* may occur in late cultivations.

Weeds are becoming important

Rorippa sylvestris in CH.

Abutilon theophrasti, *Galinsoga parviflora*, *Xanthium spinosum*, *X. strumarium* in P.

Aethusa cynapium, *Bidens tripartita* in D.

Brassicaceae in SLO.

Oxalis pes-caprae and *Calendula arvensis* in I.



Weed competition

Transplanted crops rarely suffer severe weed competition, but late maturing varieties and all drilled crops are particularly susceptible due to low initial growth rates. Typically there is no critical period of competition such that a single weeding 2-3 weeks after transplanting is sufficient to prevent yield loss. However, there is a zero tolerance of weeds that may hinder hand-harvesting or lead to contamination of minimally processed lettuces.

Approved active ingredients

Active ingredients	Application time ⁽¹⁾	UK	PL	NL	D	CH	SLO	I	E	P	HKJ
trifluralin	pres / pret	x						x			x
chlorpropham	pree / poste / postt	x		x				x			
pendimethalin	pree / pret / postt	x			x	x		x	x		x
propachlor	pret / postt	x						x			
propyzamide	any application time	x	x		x	x	x	x	x	x	
carbetamide	pree			x							
benfluralin	pres / pree / pret							x	x		
chlorthal	pree / postt							x	x		
oxadiargyl	pret								x		
oxadiazon	pret							x			
oxyfluorfen	pret										x
graminicides	poste / postt				x		x	x	x	x	x

(1) pres = pre-sowing; pree = pre-emergence; pret = pre-transplanting; poste = post-emergence; postt = post-transplanting.

No pre- or post-emergence/transplanting herbicides are registered in Turkey.



Conventional weed control

a pre-emergence or pre-transplanting treatment + (if necessary) a post-emergence / post-transplanting treatment

Integrated Weed Management System

1. false seedbed technique followed by shallow harrowings or by glyphosate or glufosinate-ammonium application
2. transplanting
3. pre-transplanting herbicide application or black plastic mulching
4. post-transplanting inter-row hoeing

Organic production

1. false seedbed technique followed by shallow harrowing
2. transplanting
3. split-hoeing and/or finger weeding or starch-based biodegradable mulching
4. hand-weeding