

Weed Seedbank Summary of Vermont Organic Farms*

The following tables summarize a weed seedbank evaluation of 25 organic farms (22 vegetable and 3 dairy) in Vermont in 2013. The locations of the farms ranged across the whole state from Brattleboro to Alburgh. A single field was sampled from each farm in early June. All of the fields had been recently tilled and had been in annual crops for at least three years or more. Within each field, 10 soil cores were collected to a depth of six inches. The soil was thinly spread on flats and placed in the University of Vermont greenhouse. On a weekly basis for six months, weed seedlings were counted, recorded and pulled. The assumption is that a germinated seedling represents one seed in the seedbank and that a majority of the seed will germinate within six months of time. Although this method does not measure the entire seedbank (since long term dormant seed is unlikely to germinate in such a short period of time), it does represent the potential seed that could likely germinate within a short period of time (one to two years).

Table 1. Summary of weed seedbank distribution, diversity (number of species per field) and density across all farms
Summary Across All Farms

	<u>Unit</u>	<u>Total Weeds</u>	<u>Average</u>	<u>Highest</u>	<u>Lowest</u>
Total Identified Weed Species	<i>number</i>	67	13	21	5
Total Identified Weed Species Density^b	<i>no./ft²</i>		274	1081	30
Total Identified Broadleaf Weed Species	<i>number</i>	52	10	16	4
Total Identified Broadleaf Weed Species Density^b	<i>no./ft²</i>		227	1068	24
Total Identified Grassy Weed Species	<i>number</i>	15	4	7	1
Total Identified Grassy Weed Species Density^b	<i>no./ft²</i>		50	229	3

^aThe total number of farms evaluated was 25.

^bReported by square foot at a soil depth of 6 inches.

Table 2. The seedbank distribution and density of grassy (monocot) weeds from 25 organic farms in Vermont.

<u>Species</u>	<u>Botanical Name</u>	<u>Type</u>	<u>Weed Seed Density^b</u>			
			<u>Distribution^a</u> <i>no. of farms</i>	<u>Average</u> <i>no./ft²</i>	<u>Highest</u> <i>no./ft²</i>	<u>Lowest</u> <i>no./ft²</i>
large crabgrass	<i>Digitaria sanguinalis</i>	Monocot	20	23	151	<1
annual bluegrass	<i>Poa annua</i>	Monocot	12	6	18	<1
smooth crabgrass	<i>Digitaria ischaemum</i>	Monocot	11	26	150	<1
witchgrass	<i>Panicum capillare</i>	Monocot	7	14	45	1
orchardgrass	<i>Dactylis glomerata</i>	Monocot	6	3	6	1
nimblewill	<i>Muhlenbergia schreberi</i>	Monocot	6	10	36	1
stinkgrass	<i>Eragrostis cilianensis</i>	Monocot	6	21	67	1
yellow nutsedge	<i>Cyperus esculentus</i>	Monocot	6	2	6	1
barnyardgrass	<i>Echinochloa crus-galli</i>	Monocot	5	4	12	<1
Canada bluegrass	<i>Poa compressa</i>	Monocot	3	3	3	3
quackgrass	<i>Elytrigia repens</i>	Monocot	2	2	3	1
wirestem Muhly	<i>Muhlenbergia frondosa</i>	Monocot	2	3	4	1
fall panicum	<i>Panicum dichotomiflorum</i>	Monocot	2	2	3	1
green foxtail	<i>Setaria viridis</i>	Monocot	1	15		
Unknown grasses		Monocot	15	9	69	<1

^aThe total number of farms evaluated was 25. Weeds species are listed starting with the most commonly distributed to the least.

^bWeed seed density is only based on the farms that had each specific weed.

*Reported by Sid Bosworth, Extension Agronomist, and Ann Hazelrigg, Extension Plant Pathologist, UVM Extension, as part of Northern New England Collaborative Research Project "Assessing the potential for emergence of new cropland weeds in the Northern New England region as a consequence of climate change", University of Vermont, University of New Hampshire and University of Maine.

Table 3. The seedbank distribution and density of broadleaf (dicot) weeds from 25 organic farms in Vermont.

<u>Species</u>	<u>Botanical Name</u>	<u>Type</u>	<u>Distribution^a</u>	<u>Weed Seed Density^b</u>		
				<u>Average</u>	<u>Highest</u>	<u>Lowest</u>
			<i>no. of farms</i>	<i>no./ft²</i>	<i>no./ft²</i>	<i>no./ft²</i>
common lambsquarters	<i>Chenopodium album</i>	Dicot	24	24	129	<1
redroot pigweed	<i>Amaranthus retroflexus</i>	Dicot	20	17	49	<1
hairy galinsoga	<i>Galinsoga ciliata</i>	Dicot	20	72	452	<1
shepherd's purse	<i>Capsella bursa-pastoris</i>	Dicot	13	6	13	<1
oak leaf goosefoot	<i>Chenopodium glaucum</i>	Dicot	13	67	814	<1
purslane	<i>Portulaca oleracea</i>	Dicot	12	34	151	1
yellow woodsorrel	<i>Oxalis stricta</i>	Dicot	11	18	180	1
plantain	<i>Plantago major</i>	Dicot	11	9	48	<1
chickweed	<i>Stellaria media</i>	Dicot	11	13	67	1
horseweed	<i>Conyza canadensis</i>	Dicot	9	15	67	1
mouseear chickweed	<i>Cerastium vulgatum</i>	Dicot	6	16	90	<1
other Brassica Species	<i>Brassica species</i>	Dicot	5	4	12	1
birdrape mustard	<i>Brassica rapa</i>	Dicot	5	148	486	1
white campion	<i>Silene alba</i>	Dicot	5	7	25	1
carpetweed	<i>Mollugo verticillata</i>	Dicot	5	27	93	1
smartweed	<i>Polygonum pennsylvanicum</i>	Dicot	5	3	9	<1
purslane speedwell	<i>Veronica peregrina</i>	Dicot	5	6	24	1
common ragweed	<i>Ambrosia elatior</i>	Dicot	4	4	14	<1
wormseed mustard	<i>Erysimum cheiranthoides</i>	Dicot	4	2	3	<1
wild strawberry	<i>Fragaria virginiana</i>	Dicot	4	9	18	1
black nightshade	<i>Solanum ptycanthum</i>	Dicot	4	10	33	<1
henbit	<i>Lamium amplexicaule</i>	Dicot	4	9	16	1
corn speedwell	<i>Veronica arvensis</i>	Dicot	4	2	3	<1
hawkweed	<i>Hieracium pratense</i>	Dicot	3	3	4	1
curly dock	<i>Rumex crispus</i>	Dicot	3	6	12	1
common groundsel	<i>Senecio vulgaris</i>	Dicot	3	1	1	1
ladysthumb	<i>Polygonum persicaria</i>	Dicot	2	2	3	1
annual sowthistle	<i>Sonchus oleraceus</i>	Dicot	2	1	1	1
corn spurry	<i>Spergula arvensis</i>	Dicot	2	3	4	1
vetch	<i>Vicia spp.</i>	Dicot	2	1	1	1
sweet clover	<i>Melilotus officinalis</i>	Dicot	2	3	3	3
VA pepperweed	<i>Lepidium virginicum</i>	Dicot	2	7	12	3
velvetleaf	<i>Abutilon Theophrasti</i>	Dicot	1	1		
yellow rocket	<i>Barbarea vulgaris</i>	Dicot	1	1		
wild mustard	<i>Brassica keber</i>	Dicot	1	1		
ground Ivy	<i>Glechoma hederacea</i>	Dicot	1	16		
field pepperweed	<i>Lepidium campestre</i>	Dicot	1	27		
yellow foxtail	<i>Setaria glauca</i>	Dicot	1	18		
perennial sowthistle	<i>Sonchus arvensis</i>	Dicot	1	3		
field pennycress	<i>Thlaspi arvense</i>	Dicot	1	3		
red clover	<i>Trifolium pratense</i>	Dicot	1	1		
white clover	<i>Trifolium repens</i>	Dicot	1	1		
narrowleaf vetch	<i>Vicia sativa ssp nigra</i>	Dicot	1	1		
bird vetch	<i>Vicia cracca</i>	Dicot	1	1		
narrowleaf plantain	<i>Plantago lanceolata</i>	Dicot	1	1		
bull thistle	<i>Cirsium vulgare</i>	Dicot	1	1		
wild geranium	<i>Geranium carolinianum</i>	Dicot	1	1		
prickly sida	<i>Sida spinosa</i>	Dicot	1	1		
common eveningprimrose	<i>Oenothera biennis</i>	Dicot	1	1		
annual fleabane	<i>Erigeron annuus</i>	Dicot	1	1		
redstem Filaree	<i>Erodium cicutarium</i>	Dicot	1	4		
Unkown Dicots		Dicot	3	3	4	<1

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^bWeed seed density is only based on the farms that had each specific weed.