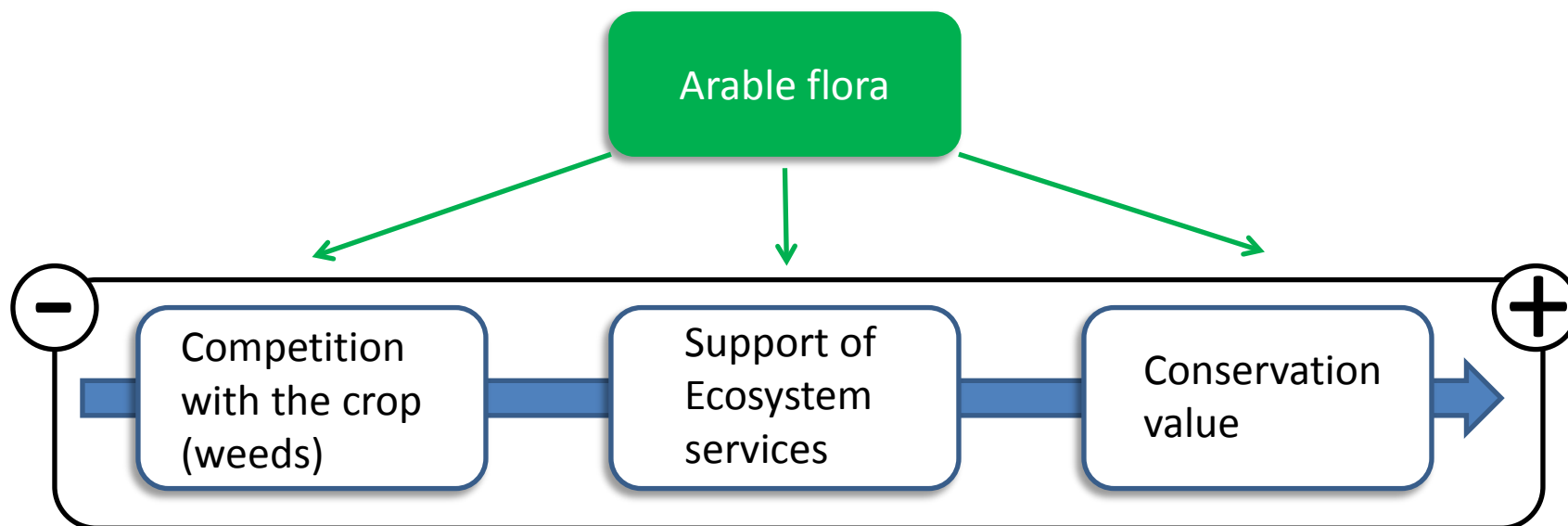


Why the world needs weed biologists

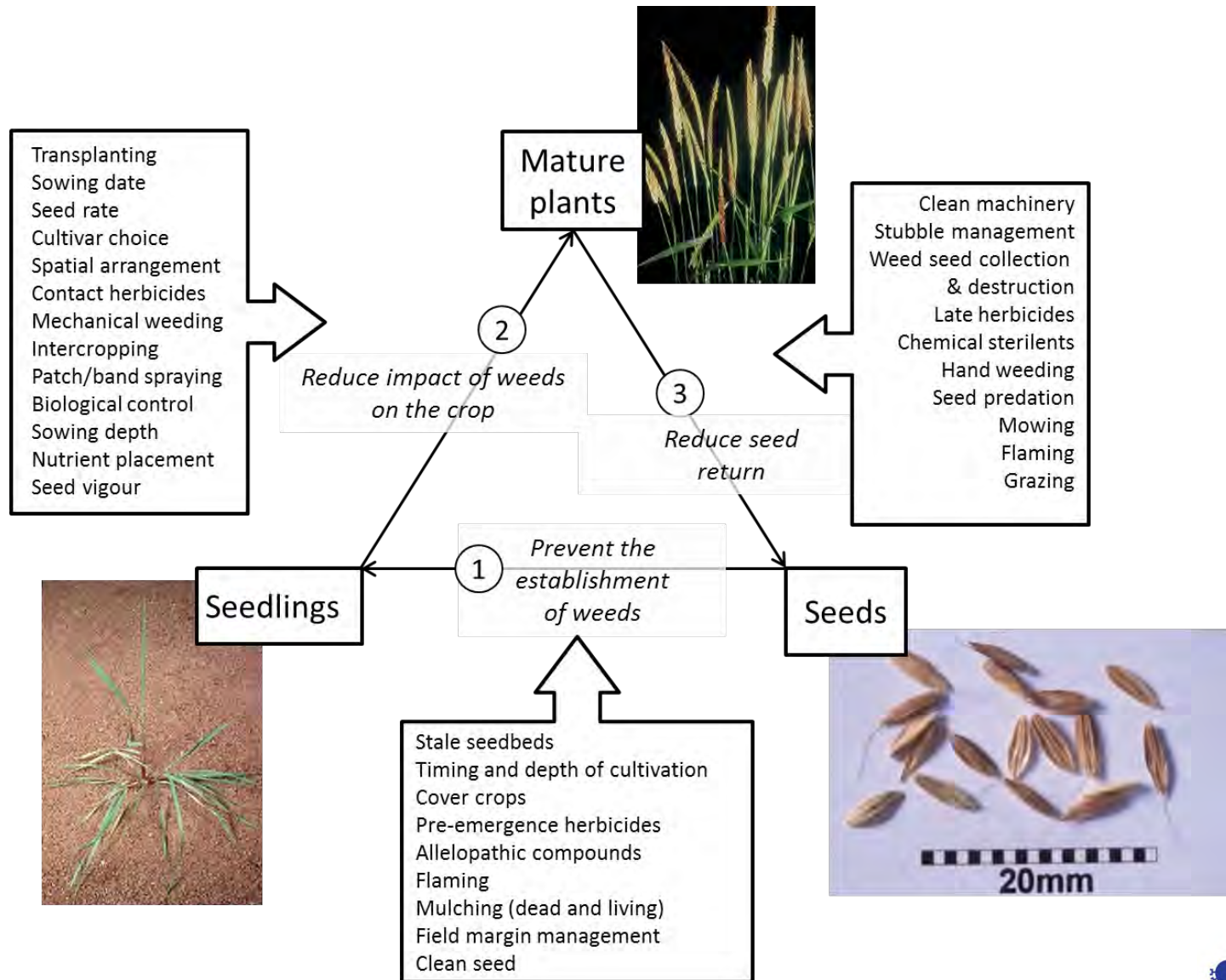
Jonathan Storkey
(Rothamsted Research)



How does non-chemical control impact weeds?



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Conventional farmers are being forced to use non-chemical methods (IWM)



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The complexity of IWM



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Crop yield loss and weed seed return =

“what does the label say?” vs.

MANAGEMENT X

WEED BIOLOGY

X ENVIRONMENT

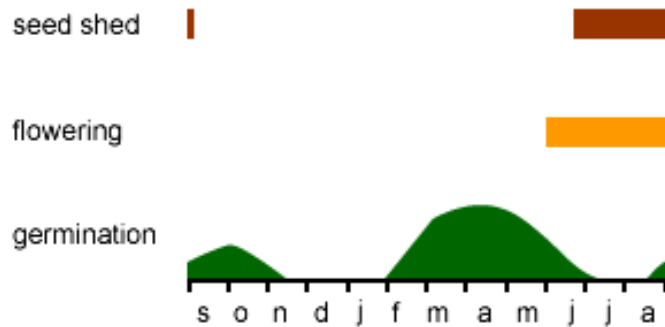


The importance of weed biology

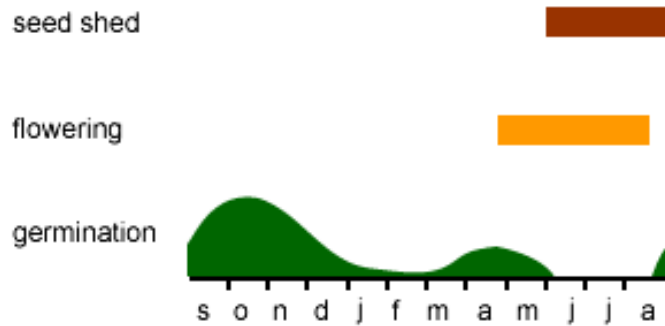


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Wild oats (*A. ludoviciana*)



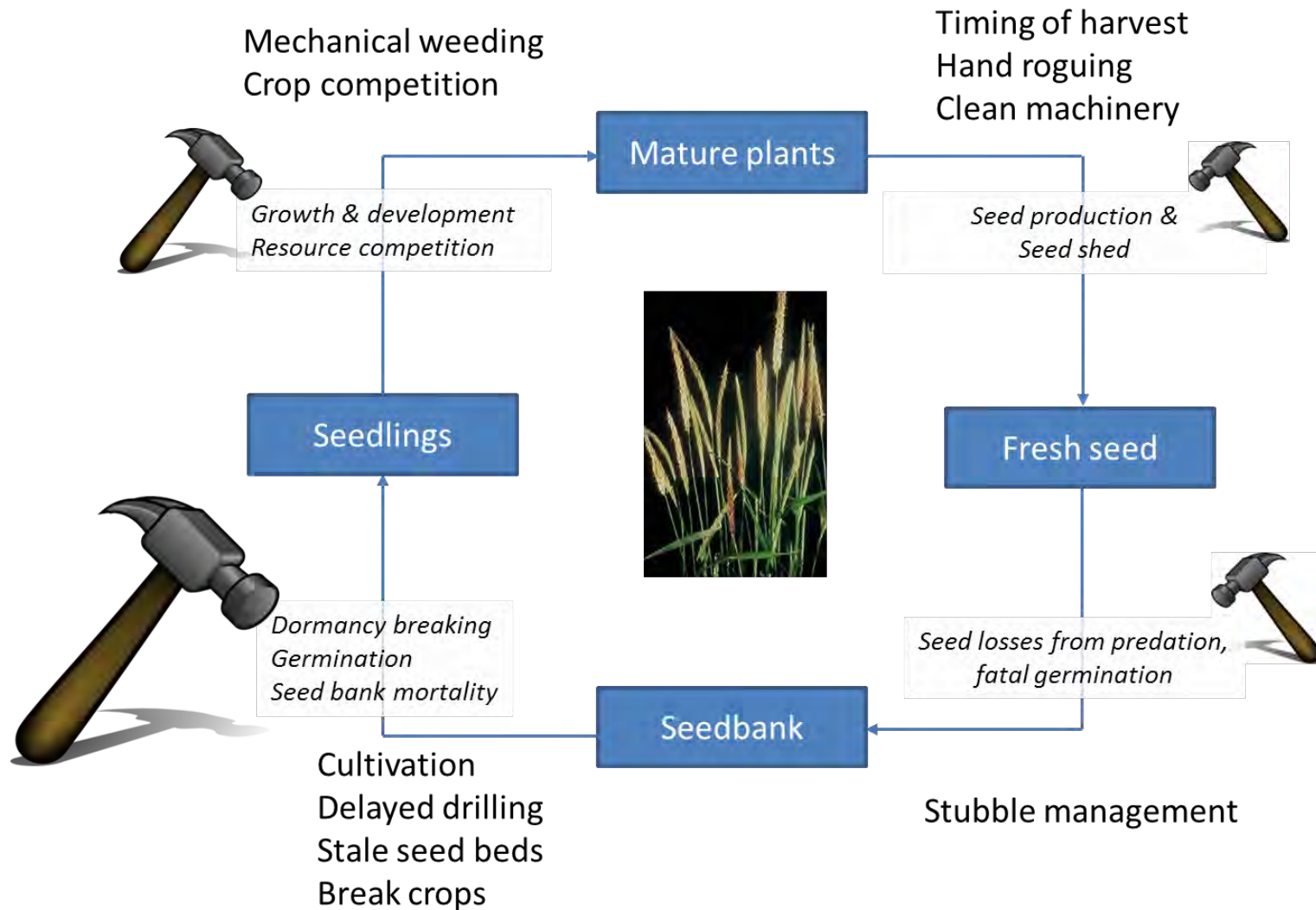
Black-grass



“Many little hammers” – black-grass



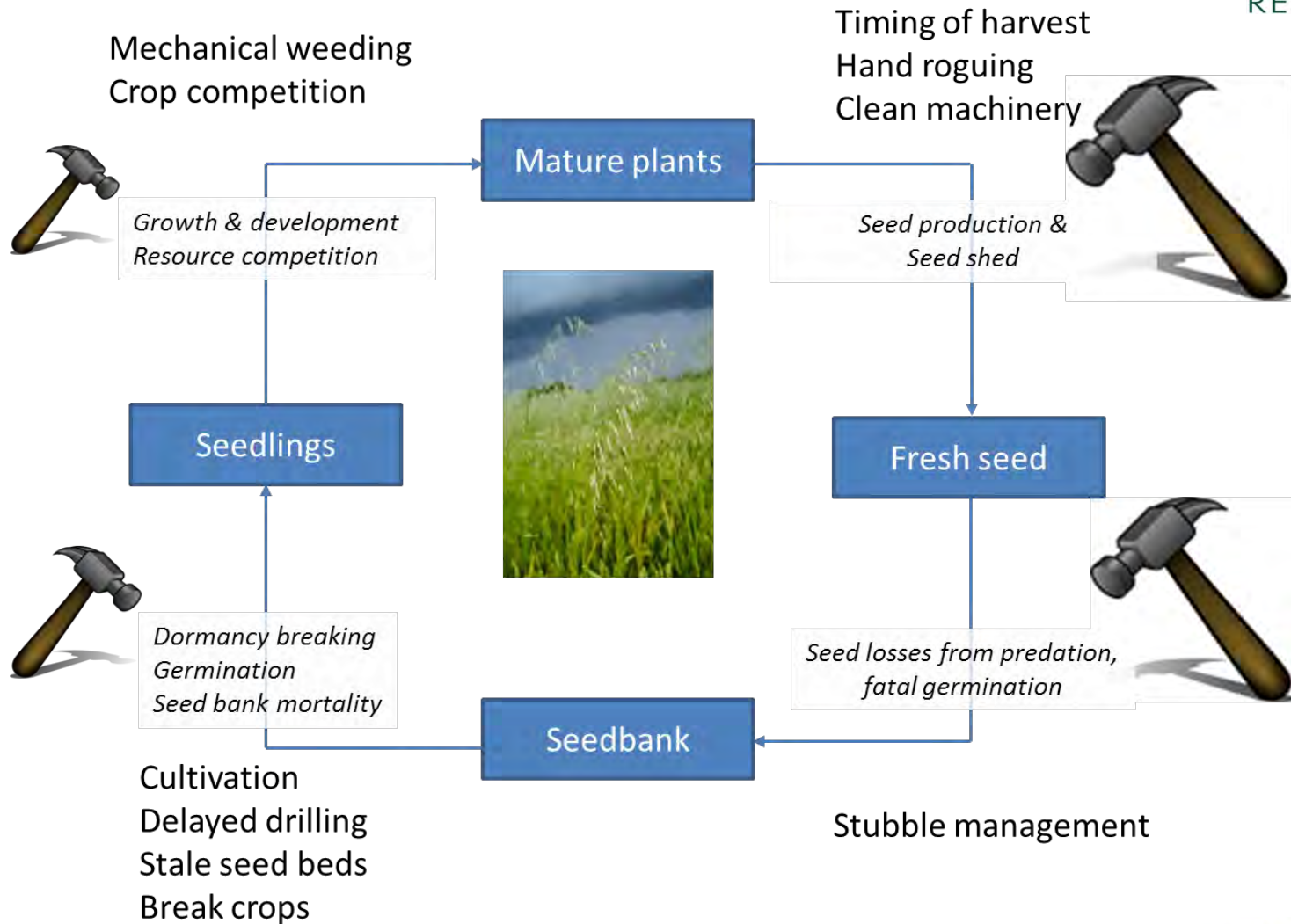
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“Many little hammers” – wild oats



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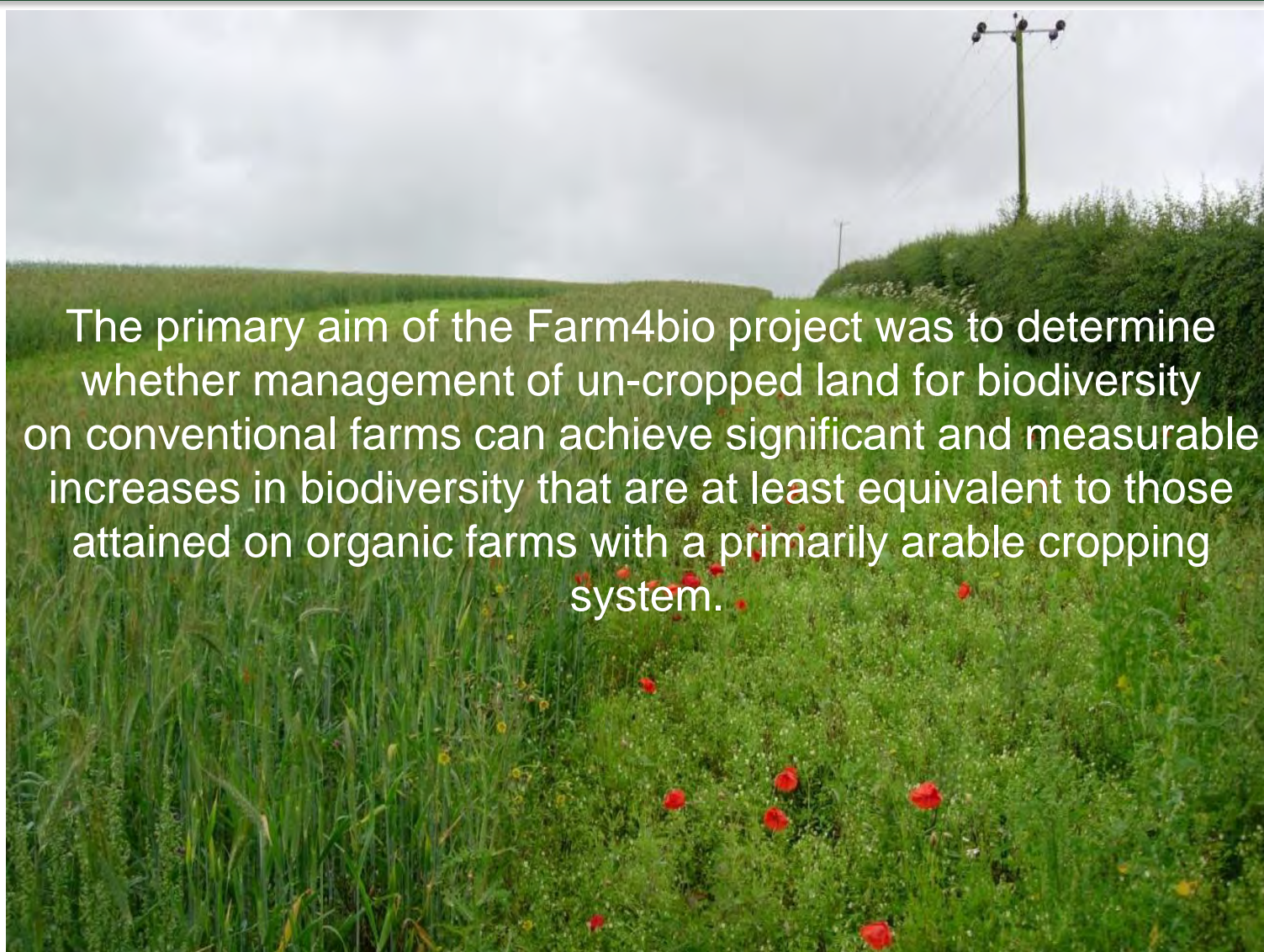
Managing uncropped land in order to enhance biodiversity benefits of the arable farmed landscape.



Introduction to Farm4bio



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The primary aim of the Farm4bio project was to determine whether management of un-cropped land for biodiversity on conventional farms can achieve significant and measurable increases in biodiversity that are at least equivalent to those attained on organic farms with a primarily arable cropping system.

Greater weed diversity on organic farms



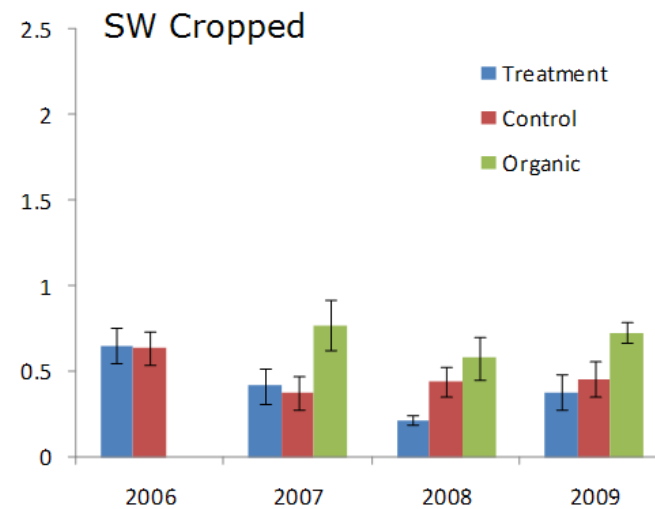
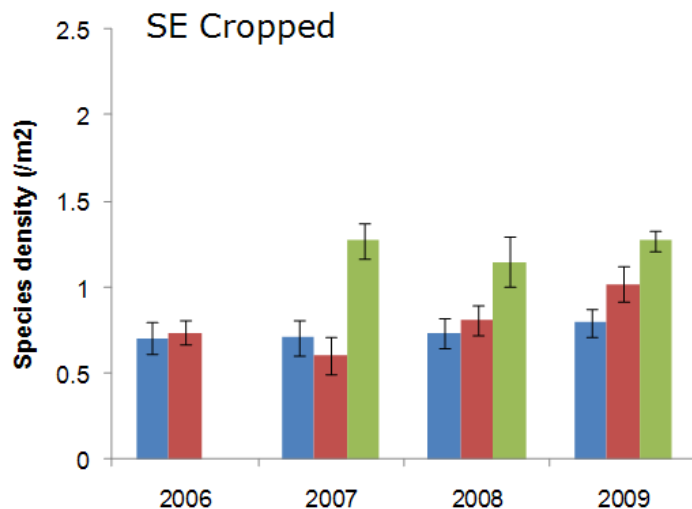
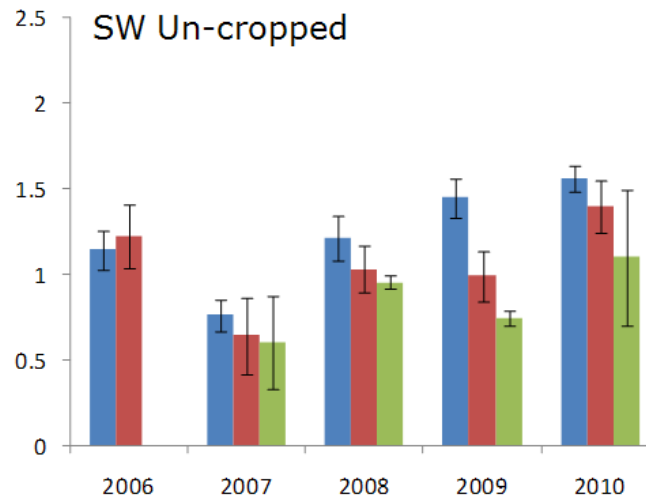
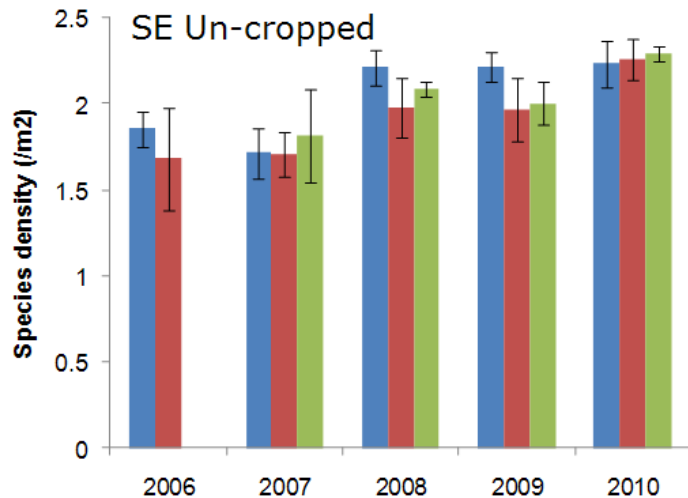
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Plant species richness	Year (2008, 09, 10)	Region (SE, SW)	Organic (+/-)	Project treatments
Un-cropped land	* (38.8, 39.2, 43.5)	*** (51.5, 29.5)	NS	NS
Cropped field	** (14.2, 16.7)	*** (20.9, 10.0)	** (22.4, 14.3)	NS

Greater weed diversity on organic farms



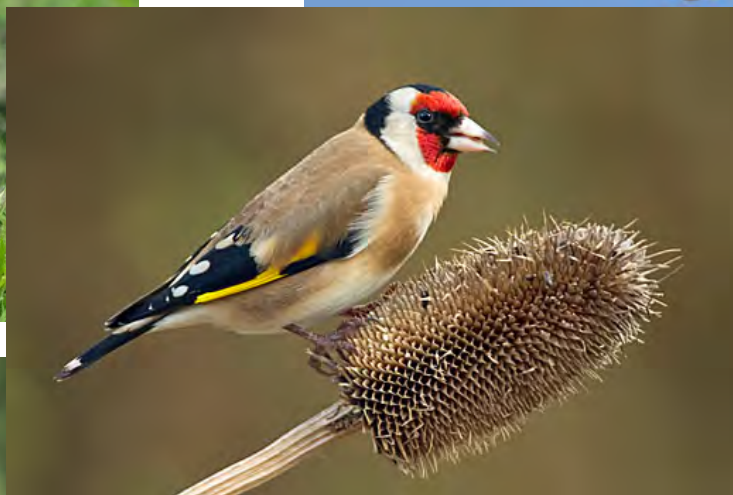
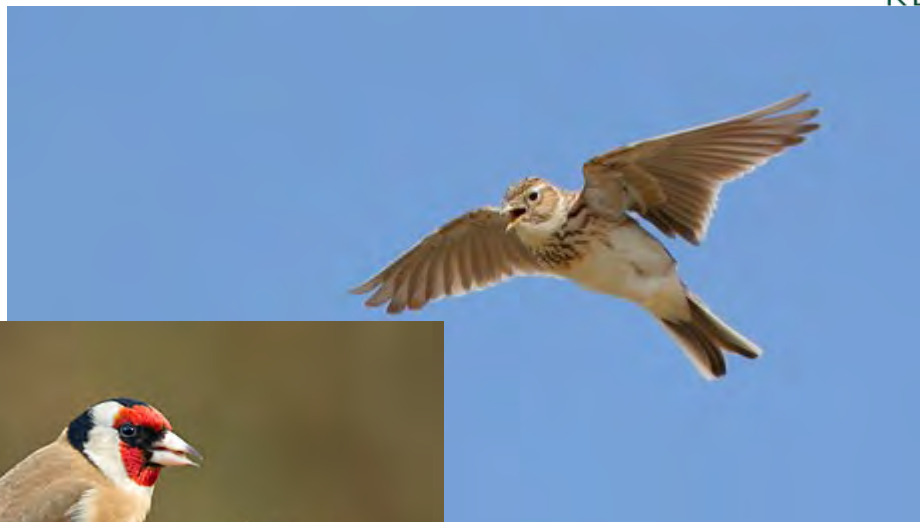
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...and greater abundance of some birds



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Weeds vary in their biodiversity value



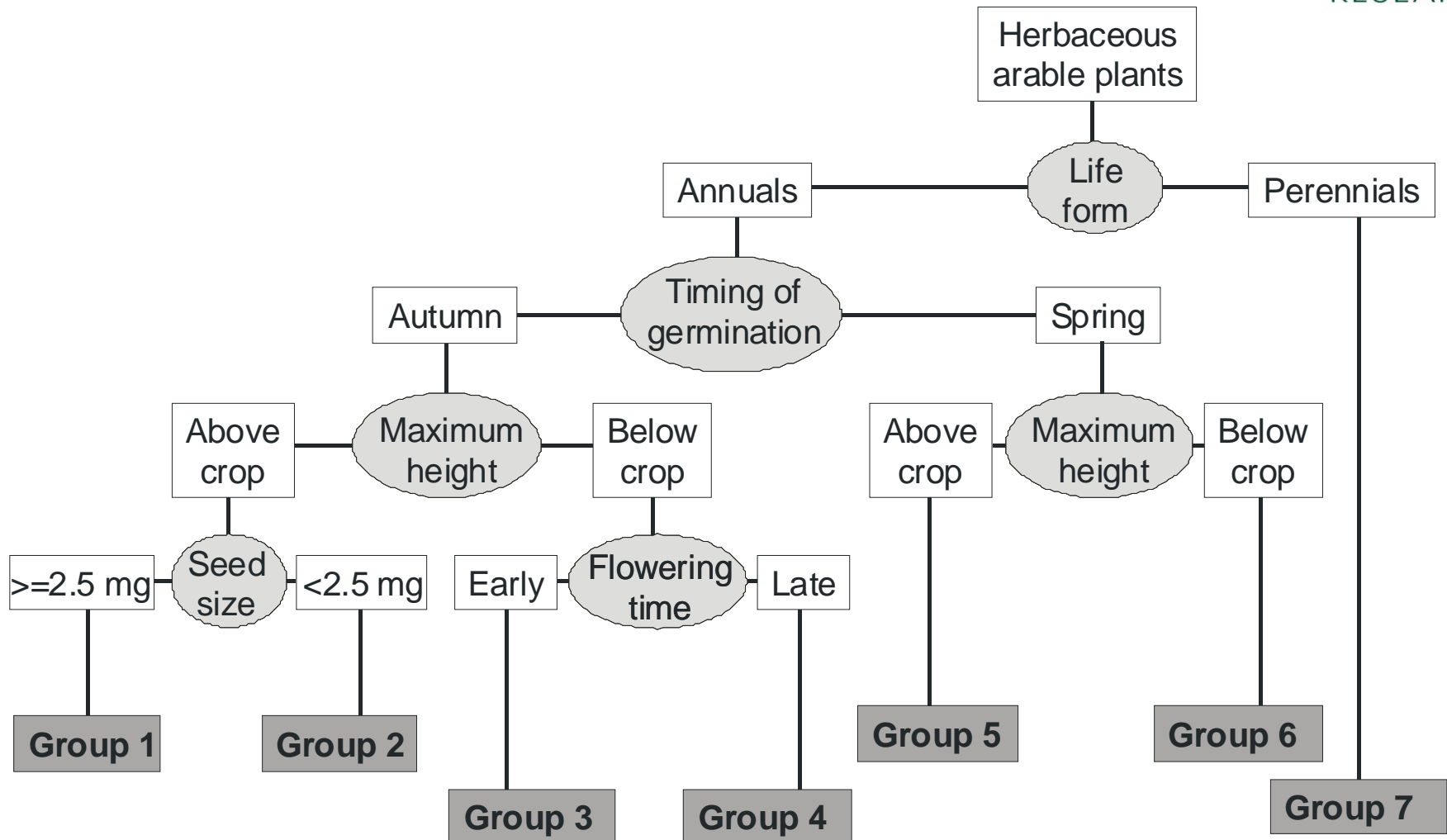
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Weed species	No. of insect species	Importance in bird diets
Wild oats	5	
Black-grass	6	
Cleavers	30	
Charlock	37	**
Scentsless mayweed	31	
Chickweed	71	***
Annual meadow grass	53	**
Groundsel	46	**
Mouse-ear chickweed	22	**
Field speedwell	1	
Field pansy	2	**
Fat hen	31	***
Knotgrass	61	***
Smooth sowthistle	28	*
Dock	79	**

This can be captured by grouping weeds



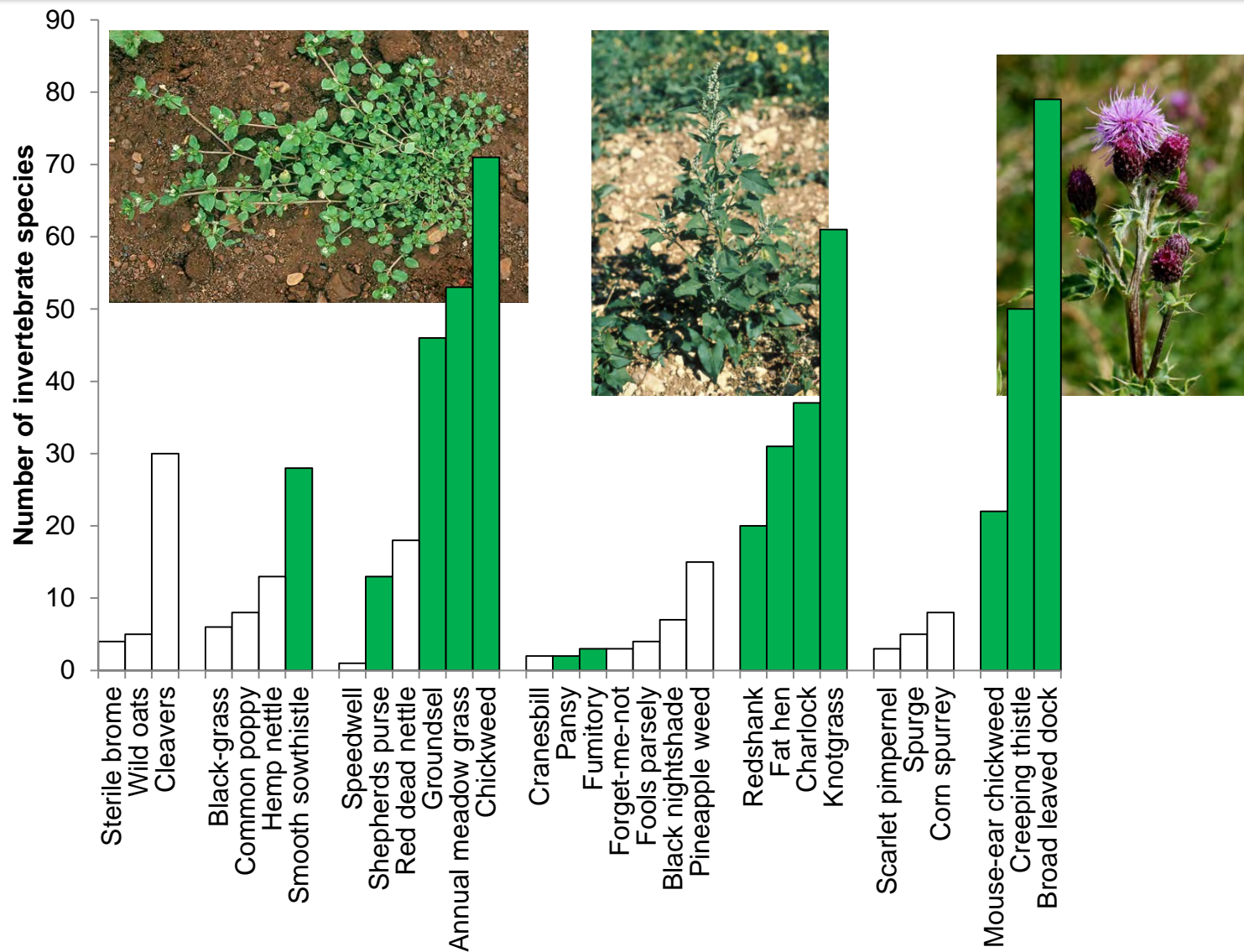
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Weeds vary in their biodiversity value



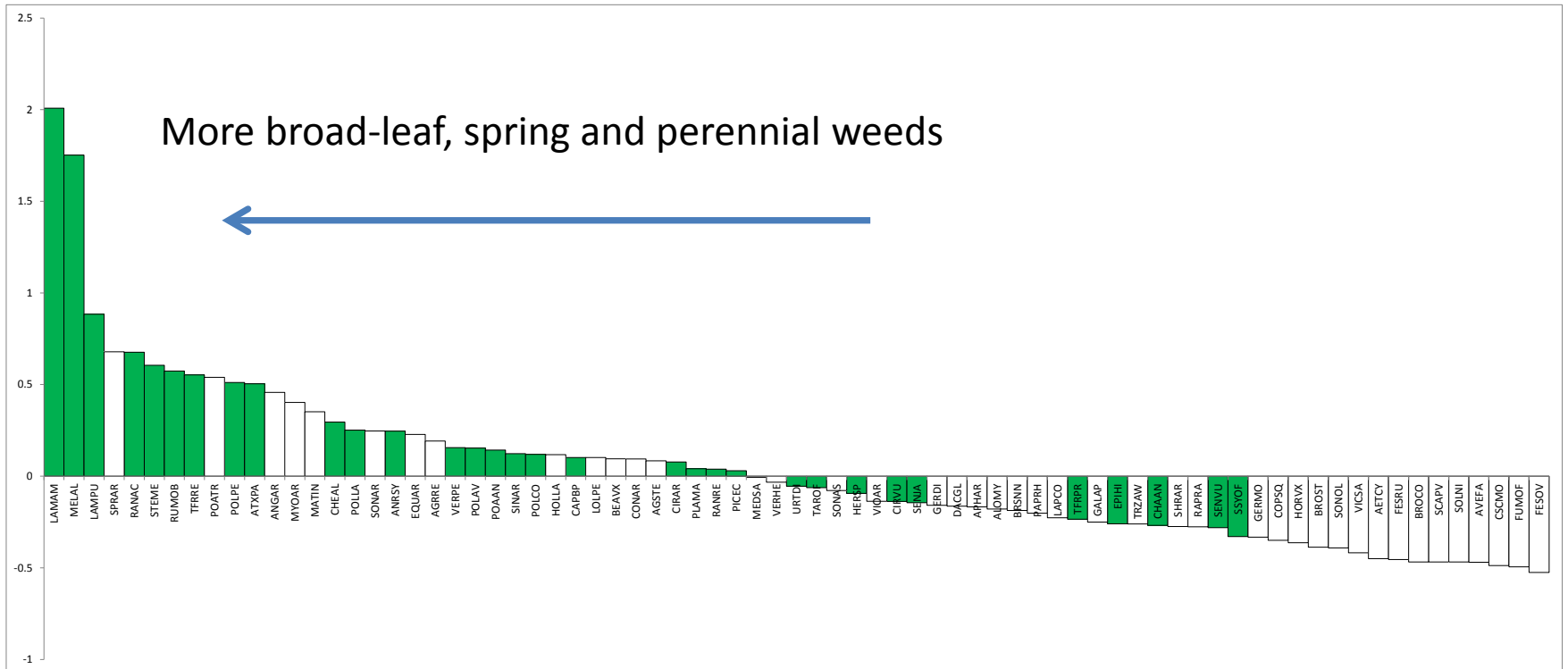
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Organic systems tend to select for more 'beneficial' weed species.

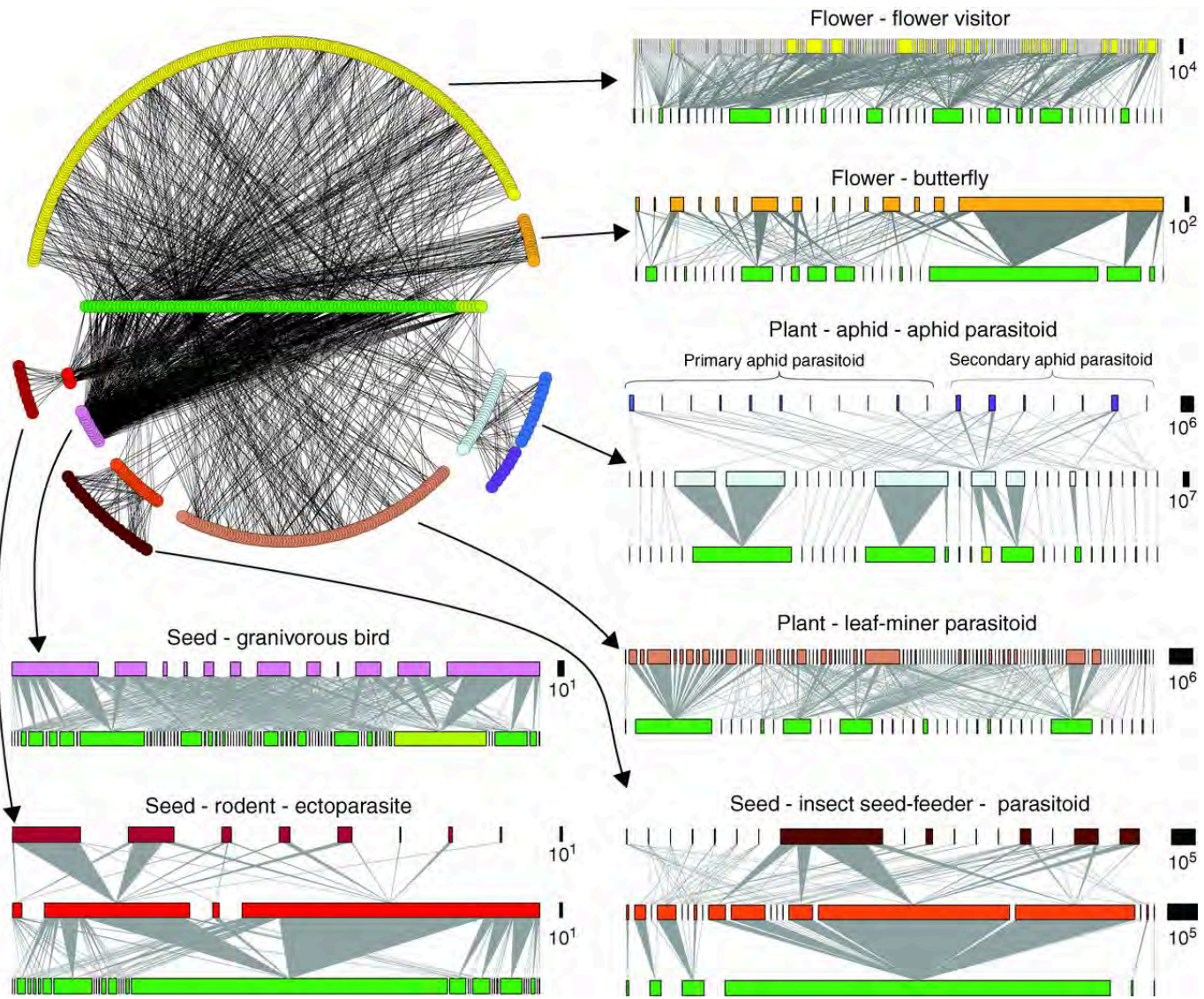


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Organic

Conventional



Michael J. O. Pocock et al. Science 2012;335:973-977

Increased organic matter may also lead to increased weed diversity (<competition?)



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