

## **Monitoring of velvetleaf (*Abutilon theophrasti*) on arable land in Saxony, Germany, in the years 2000–2003**

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### **INTRODUCTION**

In the year 2000, velvetleaf (*Abutilon theophrasti*) was registered as a weed on arable land for the first time in the Free State of Saxony by the official Plant Protection Service (Viehweger & Dittrich, 2004). As a result, the Saxon State Institute for Agriculture and regional agricultural authorities initiated a 4-year survey on its occurrence on arable land.

### **MATERIALS AND METHODS**

In order to determine the occurrence of velvetleaf on arable land, and the means of its introduction, consultations of regional agricultural authorities were carried out in the years 2000–2003, on the following subjects:

- size of infested field (ha), soil type, valuation index of field and altitude (m above sea level);
- infestation levels of velvetleaf, estimated as weed coverage (%) and its distribution within the field;
- cultivated crop plant, crop rotation, catch crops, fertilizers used (such as stable manure, semi-liquid manure and poultry dung) and herbicides used in the infested crop.

### **RESULTS AND DISCUSSION**

In the years 2000–2004, velvetleaf was found on arable land at 40 sites in Saxony (Table 1), covering a total area of 1,080 ha. However, only 5% of this area was directly infested by velvetleaf. The estimated density in the infested fields varied from just one velvetleaf plant to weed coverage of 25%. In 75% of the sites, the weed was found in sugar beet crops. The highest density of velvetleaf also occurred in sugar beet. In one case, the coverage of velvetleaf reached from 25 to 50%. The remaining occurrences were in maize, potatoes, spring barley, winter barley, winter rape, winter wheat and witloof chicory. In all but maize, only individual plants or small populations were found in each infested field. The distribution of this species in the fields was always irregular, although the weed grew mainly outside the crop rows. Most sites were located in the lowlands and hilly country in Saxony, at between 74 and 450 m above sea level. Apart from sandy soil velvetleaf grew on all soil types, but with a preference for sandy loam and loam.

During 2000–2003, mustard was cultivated as a catch crop in the rotation in 11 infested fields, oil radish in three fields, and oat and vetch in one field. Seventeen of 40 infested sites were fertilized with stable manure, seven with semi-liquid manure, three with stable manure

and semi-liquid manure, and three with poultry dung. Only on four sites were neither catch crops cultivated nor organic fertiliser applied. In 2001, seeds of velvetleaf were found for the first time in mustard seeds in Ullendorf/Taubenheim. Mustard was cultivated there as a catch crop, before the infested sugar beet. In 2001 and 2002, seeds were detected by the seed trade control (in Saxony) in three imported seed lots of catch crops: two cases in mustard and one case in oil radish. In total, 5,000 seed lots from Saxony were analysed during seed certification, but no seeds of velvetleaf were found.

Table 1. Occurrence of *Abutilon theophrasti* in crops in Saxony in 2000-2003

	2000		2001		2002		2003	
Number of sites	10		4		11		15	
Meter about sea level	80–280		74–250		100–450		83–305	
Valuation index of field	50–75		61–65		30–86		50–88	
Soil type	sL–L		sL		sL–L–T		sL–L	
Size of fields	ha	%	ha	%	ha	%	ha	%
Sugarbeet	267	95	57	74	153	48	319	80
Maize	7	2			70	22	46	11
Potatoes					50	15		
Winter rape					37	11		
Witloof chicory							35	9
Winter wheat	8	3						
Spring barley			20	26				
Winter barley					12	4		
Total	282	100	77	100	322	100	400	100

sL = sandy loam; L = loam; T = clay soil

Under Saxon conditions the optimum environment for velvetleaf is provided by sugar beet crops. The velvetleaf plants are very noticeable in sugar beet, because of their height and leaf diameter, and chemical control of the weed is inadequate in this crop (Meinlschmidt, 2004). Biological characteristics predetermine velvetleaf to become a late-summer annual and, since 2000, it has been found every year, especially in root crops. This species does not appear to migrate into arable land from ephemeral or known, especially mapped non-arable, locations. Its seeds are introduced together with those of catch crops. Fertilizers (such as liquid and solid manure, and especially poultry dung) are other possible pathways. Seeds of velvetleaf can survive digestion in large animals, without loss of viability, and can be transported in the manure directly to the field. Imported animal feed could be the original source. Because of its biology and means of introduction, the future, further spread of velvetleaf on arable land cannot be ruled out.

## REFERENCES

- Meinlschmidt E (2004). Gebietsfremde potentiell invasive Ackerunkräuter in Sachsen. *Gesunde Pflanze* **56**, 86-92.
- Viehweiger G; Dittrich R (2004). Die Samtpappel (*Abutilon theophrasti* MED.) als neues Unkraut in Sachsen. *Gesunde Pflanze* **56**, 2-10.