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# **Small scale domestic cannabis cultivation:**

**an anonymous web survey among 659 cannabis cultivators in Belgium**

**(Revised version – 15 September 2009)**

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## **Abstract**

The shift to (inter)regional production, trade and domestic cultivation has become an irreversible international trend. Until now, the focus of most empirical work has been on large-scale, commercially oriented and professionally organized segments of the cannabis industry, often based on police data and on the perspective of law enforcement agencies. This paper presents some significant findings from a large-scale study on a less visible and less studied segment of the market, i.e. small-scale cultivators, based on an anonymous web survey among 659 cannabis cultivators. The paper discusses the patterns of cultivation, some technical aspects of growing operations, (dis)advantages of cannabis cultivation, and perceived quality and strength of home-grown cannabis. The author argues that small-scale or amateur home growers constitute a significant segment of the cannabis market, both in a quantitative and in a qualitative perspective, and points at important differences between this sample obtained online with those obtained through traditional methods in other studies.

## **Key Words**

Cannabis, cultivation, web survey, amateur

## **1. Introduction**

Over the last three decades the organizational structure of the marijuana trade has undergone major changes: with the advent of new cultivation techniques and the cross-breeding of cannabis varieties that thrive in our regions, local cannabis cultivation has boomed, at the expense of bulk-imported foreign cannabis. Today the shift to (inter)regional production, trade and domestic cultivation has become an irreversible international trend (especially in North America and Europe) (Szendrei, 1997; UNODC, 2006). Large shares of marijuana supplies are now produced domestically in the United States (Reuter, Crawford and Cave, 1988; Weisheit, 1992; Gettman, 2006), Canada (Plecas, Dandurand, Chin & Seger, 2002; Plecas, Malm & Kinney, 2005; Bouchard, 2007), New Zealand (Wilkins & Caswell, 2003), the Netherlands (Jansen, 2002; Spapens, van de Bunt & Rastovac, 2007; Wouters, Korf & Kroeske, 2007) and the United Kingdom (Hough, Warburton, Few, May, Man et al., 2003; Potter, 2006). A number of other European countries, including Belgium, have been catching up with this trend and find that their home production of cannabis has been increasing (Decorte, 2007; Hakkarainen & Perälä, 2009; Asmussen, 2009).

These changes in the organization of the cannabis market raised important questions for drug market researchers. Some authors have tried to estimate the size of the domestic cultivation industry, in terms of dollar turnover rates (Wilkins, Battha & Casswell, 2002a; Caulkins & Reuter, 1998; Rhodes, Layne, Johnston & Hozik, 2000) or in terms of number of plantations or people involved (Bouchard, 2007; Wouters et al., 2007). Others have looked at the opportunities for new and existing offenders to enter the illegal trade (Bouchard, Alain & Nguyen, 2009).

Experts often suggest that law enforcement interventions may have contributed to the substitution of the importation-driven industry with a production-driven industry (Chin,

Dandurand, Plecas & Segger, 2000; Reuter et al., 1988). Domestic marijuana production is considered as an adaptive strategy triggered by increases in risks of arrest and risk of detection among importers. Law enforcement pressure, especially large-scale eradication programs, may also have contributed to the trend from outdoor towards indoor cultivation (Wilkins, Battha & Casswell, 2002b; Gettman, 2006).

Some have argued that local cultivation of cannabis plants used to be a rare phenomenon and mostly the work of ‘amateurs’ to meet their own needs in a cheap way, but that it has evolved into a (very) professional enterprise since the late eighties. The rise of domestic or regional cannabis cultivation is then associated with heightened levels of criminal organization (Hafley & Tewksbury, 1995; Spapens et al., 2007), involvement of ‘gangs’ (Plecas et al., 2002), and higher levels of violence (Walker, Cocklin & Blunden, 1998). These claims are often echoed in the media, and by policy makers and drug warriors, but it remains extremely difficult to empirically verify the role criminal groups play in the cannabis market. Empirical studies that focus only on large-scale, commercially oriented growers, base their conclusions on police data, and take over the perspective of law enforcement agencies, may lead to false perceptions of the prevalence of different types of growers and growing operations (Wilkins & Casswell, 2003). They can have important consequences for future policy choices, as is illustrated by the recent events in the Netherlands. One of the most influential publications in the Low Countries was the study by Bovenkerk and Hogewind (2002). On the basis of interviews with police officers, they focused on the profile of professional large-scale producers and organizers of industrial cannabis production, and on the professionalism of and organizations behind plantations discovered by police actions in the Netherlands. They argued that cannabis cultivation had become a matter of organized crime, rather than of innocent gardening. This study instigated the Dutch authorities to pursue a tough policy against the domestic cultivation of cannabis.

If both police claims and one-sided empirical studies may lead to an exaggerated and false perception of the prevalence of large-scale cannabis cultivation and gang-based cultivation, another question that arises is whether there is a risk of underestimating small-scale, independent or 'ideological' cultivation.

Very few authors have focused on the latter categories. Even though Weisheit (1990, 1991a, 1991b, 1992) studied arrested and large scale marijuana growers (with at least 20 plants) in Illinois (USA), his study is unique in that it illustrated the intangible (spiritual, social and intrinsic) rewards of growing marijuana, and not just the financial profits. Hough et al. (2003) demonstrated that marijuana cultivation, for a larger number of growers, is not just about money but also about the love of the plant. Others have acknowledged the existence of 'ideologically oriented' dealers and growers, but they either argued these 'trading charities' and 'mutual societies' died out in the 1980s as they were replaced by more criminally orientated drug dealers (Dorn and South, 1990), or they claimed their market significance is minor in terms of the total amount of marijuana produced (Bouchard, 2007).

Several authors have constructed typologies of cannabis cultivators (Weisheit, 1992; Hough et al., 2003; Bovenkerk & Hogewind, 2002), but the focus of their empirical work has been on large-scale, commercially oriented cultivators. Small-scale cultivators (cultivators 'for personal use', the 'medical' cultivators, the 'pragmatists', the 'social' or 'social-commercial cultivators', the 'home cultivators' or 'hobbyists') have hardly been studied. An exception is Potter's recent study of domestic cannabis production in the UK with an ethnographic approach. Potter's typology of cannabis growers emergent in the UK, and the variety of sizes, structures and types of cannabis distribution operations he describes resemble those identified by others, but he argues that whether or not alternative, ideological dealing outfits did disappear completely, they are back now, at least in relation to the home-grown cannabis market. Most of the growers he studied were motivated at least in part (and

often as much if not more than by financial incentives) by ideological positions associated with cannabis itself – the plant, the drug, or what it represents socially and culturally. His argument is that the ideological approach to drug-dealing is fighting back against the criminal element and all that entails. Consumer demands for good quality drugs, fairly traded and kept separate from other forms of criminality. Co-operative growers are challenging corporate growers for both their dominance of the market and the way that business is conducted within it.

These claims still leave important questions about our understanding of how the marijuana market is structured unanswered. A first question concerns the size of the segment of small-scale, independent and/or ‘ideological’ growers. A second question concerns the reasons why these growers have gradually chosen home growing over buying their cannabis through other supply channels. In the absence of more research on this particular segment, it remains difficult to evaluate the empirical value of the hypotheses formulated above. This paper presents some significant findings from an anonymous web survey among 659 cannabis cultivators in Belgium. Some implications for future research on domestic cannabis cultivation are put forward.

## **2. Objectives**

Reports on cannabis plantations in the Belgian media have multiplied spectacularly since 2001 (Ghijs, “The Dutch organize Belgian cannabis cultivation. Number of confiscated plants doubled in 2004”, 2005); Van Baelen, “Number of dismantled drug plantations tripled”, 2005). Plantations covered by Belgian media reports are usually instances of *indoor* cultivation set up for commercial purposes, and they are often located in the northern and

eastern municipalities near the Dutch border. The Belgian police claim numerous plantations are financed and/or organized by Dutch entrepreneurs and that a large proportion of cannabis produced in Belgium finds its way to the Dutch coffee shops (Ghijs, “The Dutch organize Belgian cannabis cultivation. Number of confiscated plants doubled in 2004”, 2005; Van Baelen, “Number of dismantled drug plantations tripled”, 2005). The media often suggest that cannabis cultivation in Flanders is increasingly a matter of Dutch producers who have been forced by stricter law enforcement to move across the border into Flanders (X, “Dutch mob grows cannabis at Belgian farms in financial distress”, 2006). The media discourse which allows policy makers and drug warriors to associate the rise of domestic or regional cannabis cultivation with ‘professional’ and ‘criminally organized’ growers, is manifestly related to the fact that the police forces in the Netherlands and in Belgium have given a higher priority to the war on cannabis cultivation. Until recently, there were no empirical studies of cannabis cultivation in Belgium. The data that are available are based on police data and relate to large-scale, commercially oriented growers. They reflect the perspective of law enforcement agencies. Between January 2006 and December 2007 the Institute (for) Social Drug Research (ISD) at Ghent University conducted a large-scale study of a (hitherto underinvestigated) segment of the sector, i.e. small-scale personal and social home cultivation. The aim of the study was to recruit as many cannabis growers as possible, and to establish a picture as refined as possible of their profiles and backgrounds, motives and experiences, cultivation careers and strategies, as well as their know-how and ideas concerning the cultivation of cannabis. One part of this larger study consisted of an anonymous web survey among 659 cannabis cultivators in Belgium.

### **3. Methodology**

At a previous stage of the study a semi-structured questionnaire had been developed and tested for face-to-face interviews with cannabis cultivators. With the help of privileged access interviewers and through snowball sampling 89 cannabis cultivators had been interviewed. Based on this questionnaire and after coding all answers to the open-ended questions, a shorter version was developed for use in an anonymous web survey.<sup>1</sup> To reduce the time necessary for downloading and completing, the questionnaire was limited to 54 structured questions with structured responses (only in Dutch). For each question respondents could tick the answer ‘I do not wish to answer this question’ or ‘other’. When respondents ticked the latter, they were allowed to explain their choice in a string variable, allowing for 250 characters. To keep the dropout rate of the respondents as low as possible, we included only one open-ended question (‘Which varieties of cannabis do you or did you grow?’).

“On the Internet nobody knows you’re a dog”. The anonymity afforded by internet-based research is an important part of its success in recruiting hidden populations, but it also makes it easier for people to respond multiple times, either mistakenly or deliberately. We tried to avoid multiple responders by explicitly instructing people to only participate once, and not offering any financial compensation for their research participation. In order to intercept double counting, every respondent received a unique ID and we scanned our database for duplicate or very similar IP addresses. Only Dutch speaking individuals could participate in the study, as the web page, the calls for participation (see below) and the questionnaire itself were in Dutch.

Privacy-sensitive questions were asked at the end of the questionnaire (Cho & Larose, 1999; Andrews, Nonnecke & Preece, 2003). During one week we tested the questionnaire for completeness of the questions, relevancy of the questions, understandability of the language

used, possible differences in interpretation, and logical hierarchy of the questions. Completing the questionnaire took 30 to 40 minutes.

To respect the ‘informed consent’ principle as much as possible, we guided all respondents first to a web page where the aim of the study was clearly explained (in Dutch). We made it clear that the survey was organized by the Institute for Social Drug Research (Ghent University) and not funded by any external organization. We also explained how privacy was guaranteed, and how the data would be analyzed and presented (Schonlau, Fricker & Elliott, 2002; Keller & Lee, 2003; Pittenger, 2003).

The internet survey was linked to the website of the Institute (for) Social Drug Research (ISD) where it could be completed on-line . To boost response rates, the attention of potential participants was drawn to the internet survey both through online and offline invitations (Mann & Stewart, 2000):

1) Emailing all staff members (ca. 6,400) and students of the University of Ghent ca. 28,000), and professional colleagues at the Catholic University of Leuven, the University of Antwerp, and the University of Brussels (Vrije Universiteit Brussel), who further distributed the call for participation among their students and fellow drug researchers. An identical email was sent to Belgian drug experts, drug researchers, and personal friends and acquaintances.

2) The study (including the URL of the web survey) was announced through the press agency **Belga** and three **Flemish newspapers** in May 2006. After these calls for participation, several radio shows and a regional television show broadcast interviews with the author, explaining the objectives of the web survey and referring to its URL. For a short period of time, these newspapers and radio shows mentioned our internet survey (and the URL) on their own websites.

- 3) At our request, several **specialized internet sites** and discussion fora (including [www.cannabis-belgië.com](http://www.cannabis-belgië.com) and [www.cannaclopedia.be](http://www.cannaclopedia.be)) posted a message about the study, mentioning the internet address, and a call for participation.
- 4) *Highlife*, a well-known Dutch **magazine for cultivators of cannabis**, published an interview with the author in their August-September 2006 edition, focusing on the background and objectives of the study, and referring to the URL of the web survey.
- 5) Finally, in the summer of 2006, more than 5,000 flyers were distributed at several summer festivals and events in Flanders.

During the period in which the questionnaire could be completed -May 15<sup>th</sup> till August 31<sup>st</sup> 2006 – the website was visited by over 4,000 people and 1,362 visitors started to complete the questionnaire. However, only 659 questionnaires proved to be sufficiently usable. A number of respondents (n=16) were removed from the sample because they clearly and purposively gave nonsensical answers. All questionnaires (n=687) with fewer than 18 of the 54 questions answered (i.e. fewer than one third of the questions) were also removed from the sample. A total of 703 responses, or 51.6% of the (partly) completed questionnaires, were not usable.

The data were mainly analysed by means of simple, descriptive methods. In view of the qualitative nature of this study (the variety of types of growers and motives for growing cannabis was of more interest to us than the prevalence of cannabis cultivation in the general population or the search for causal relations) and the limited research budget, no advanced statistical analyses were performed. The data were processed with the statistical package SPSS 11.0. The answers to the open ended questions were coded independently by two researchers.

Using a web survey to study a sensitive topic such as cannabis cultivation offered several advantages. The internet is a useful avenue to obtain data, as many cannabis growers

are reluctant to discuss their activities in face-to-face interviews (Coomber, 1997). An anonymous web survey may reduce fear or suspicion, and raise the chance to obtain honest and accurate answers, as the respondents are allowed to choose a convenient moment and a safe environment to complete the questionnaire (Mann & Stewart, 2000; Schonlau et al., 2002). Another major advantage of a web survey is that a vast number of people can be reached, even if the targeted population of potential respondents is small (Schmidt, 1997). Moreover, web surveys allow the researcher to collect and process data quickly and at low cost. Since our study was not funded by any external organization or research fund, this budgetary aspect was of some importance.

However, the use of the internet also presents a number of methodological problems and limitations. It only allows non-random and non-probabilistic sampling techniques (Andrews et al., 2003). The quality of the data is undoubtedly compromised because of the problem of **coverage error** and the degree of internet penetration associated with it (Dillman, 2000; Dillman & Bowker, 2000; Mann & Stewart, 2000; Bandilla, Bosnjak & Altdorfer, 2003).<sup>2</sup> Secondly, because of the uncontrolled distribution of the instrument and the self-selection of the respondents (the so-called '*volunteer effect*'), the sample cannot be truly representative (Schonlau et al., 2002; Couper, 2000; Eysenbach & Wyatt, 2002). Furthermore, we were unable to check the identity of each respondent and verify whether he or she belonged to our target population (i.e. Flemish cultivators of cannabis) (Schonlau et al., 2002), and several factors may contribute to a heightened **response error and item non-response**: variations in the user's browser setting, the survey software, the respondent's skills, the time required to download the questionnaire, the perception of the time required for completing the questionnaire, etc. (Andrews et al., 2003). Respondents who take part in web surveys have been known to submit incomplete questionnaires, skip questions by mistake, include unacceptable or incorrect data, etc. (Schmidt, 1997).

It may be impossible to determine the degree and the importance of bias in our sample (Coomber, 1997), but it remains useful for developing hypotheses and for performing qualitative analyses (Schonlau et al., 2002). As the objectives of the study are of a qualitative nature (rather than measuring the extent or the prevalence, we wanted to study the variation among cannabis cultivators and different motives for growing cannabis), the non-representative nature of the sample is less relevant (Schonlau et al., 2002).

## **5. Results**

### *5.1. Socio-demographic characteristics of the sample*

The web survey participants were between 16 and 60 years old, their average age was 28.5 years, 88.5% of the respondents were male and 11.5% female. The majority were unmarried (77.5%), and with no children (83.1%). Ninety-two respondents were married or lived with a partner (18.2%). More than half (65.2%) stated that they were in a 'steady' relationship. Less than one third (30.0%) lived with their parents. Almost one fifth lived on their own (19.5%), while 39.1% lived with their partner (and children).

Nearly half of the sample (47.6%) had a higher education degree. One-third (34.1%) were currently attending higher education or training. The sample were relatively highly educated, which may be related to the use of internet for data collection (higher educated people have more readily and/or more often access to the internet).

Only 21 respondents (3.9% of the sample) declared ever having been caught by the police for the cultivation of cannabis. Only a few (2.5% of the sample) stated they had been formally charged and convicted for cultivating cannabis.

## *5.2. Patterns of cultivation*

The web survey respondents were on average 20.69 years old when they cultivated cannabis for the first time. The youngest cultivator had started at the age of 13, the oldest at the age of 57. In our sample 31.9% were minors (under 18 years old) when they grew cannabis successfully for the first time .

Unsurprisingly, growing one's own cannabis is fairly easy according to these participants: more than one half of the growers had managed to harvest cannabis at their first attempt at cultivating. The cultivation of cannabis is rather time-consuming (86.0% attended to their cannabis plants more than once a week). Participants invested little money: on average 31.51 euro per effort (the median value was 25 euro). More than 8.0% of the respondents invested less than 50 euro per effort to cultivate cannabis.

We recruited more small-scale than large-scale cultivators: two out of three participants did not grow more than five plants, more than three out of four respondents had a plantation of maximum ten plants. The number of plants cultivated on average during one single harvest, amounted to maximum 8.47 plants (the median was 4). Moreover, the growers we reached were not very experienced: on average they had harvested 4.10 times (the median: 3). Nearly one in three had achieved only one successful harvest at the time of the survey. We asked participants if they were actively cultivating cannabis at the time of the survey, but many participants (16.6%) refused to answer this question. Of those who were willing to answer the question, 57.8% were growing cannabis at the time of the survey.

The majority (72.2%) cultivated on their own. Some always cultivated together with other growers, some only did so occasionally. On average, respondents knew 6.3 other cultivators (the median was 4).



### *5.3. Technical aspects of growing operations*

The proportion of outdoor cultivators was remarkably high (53.2%). Still, one in three participants (35.1%) made use of artificial lighting. Organic and nutritious chemical substances and fertilizers were used relatively often (30.6%). Hardly anyone used a hydroponic culture system (barely 3.5% of the sample).

In the sample, 75.9% used seeds and 53.5% used cuttings. Only 9.4% of the respondents indicated a (Dutch) *grow shop* as a supplier. Half of the respondents (50.1%) mentioned (Dutch) coffee shops as a supply channel. It is unclear whether these growers actually bought their seeds in the coffee shop, or whether they derived their seeds from cannabis bought in a coffee shop. However, a quarter of the respondents had – at some point in their growing career - derived seeds from cannabis they had bought, and nearly as many respondents claimed to have drawn seeds or cuttings from previous harvests. The share of the internet as a source of supply (14.6%) is also remarkable.

About half of our respondents (52.9%) preferred to grow specific varieties. In total they mentioned more than 151 different varieties of cannabis. It was impossible to check whether all the names respondents mentioned corresponded to existing varieties, and whether some may have been showing off by mentioning (or even making up) as many varieties as possible. The most popular varieties among these growers were ‘White Widow’, ‘Northern Light’, ‘Skunk’ and ‘Haze’. However, it is equally remarkable that 34.9% of our participants did not answer this question, and that 12.1% explicitly stated they did not have a clue about the variety they were cultivating.

The most important channel of information for our sample of cannabis growers was the internet (see Table 1), but this may be related to the fact that we had recruited them through the internet in the first place. Other channels of information were friends and

acquaintances (probably including cannabis growers) and specialized literature (manuals). It is remarkable that for the larger part of our sample (58.0%) *grow shops* played only a minor role as a channel of information. Only one in three cultivators (31.9%) stated they had found essential information in a *grow shop*.

**Table 1 Possible sources of information about cultivation \***

	Not important	Neither important nor unimportant	Important	Average
Internet <sup>[511]</sup>	21.3	9.0	69.7	5.25
Friends/acquaintances <sup>[533]</sup>	29.1	14.3	56.7	4.63
Literature <sup>[478]</sup>	42.2	11.7	46.0	4.00
Grow shop <sup>[447]</sup>	58.0	10.1	31.9	3.23
Specialized magazines concerning cannabis <sup>[427]</sup>	61.6	11.0	27.5	2.94
Coffee shop <sup>[405]</sup>	86.7	4.9	8.4	1.79
Media <sup>[414]</sup>	89.4	2.9	7.8	1.72
Smart shop <sup>[396]</sup>	88.4	4.5	7.1	1.63
Family <sup>[384]</sup>	90.4	3.4	6.2	1.54
<i>I do not wish to answer to this question</i>	8			
<i>Void</i>	76			

\* The number of valid answers per source of information is in small captions between square brackets in the left column.

Note: This table is based on a structured question with structured response categories. Respondents could tick the answer 'I do not wish to answer this question' or 'other'. When respondents ticked the latter, they were allowed to explain their choice in a string variable, allowing for 250 characters. These answers were recoded afterwards.

Other sources, such as specialized magazines for cannabis growers, the media, coffee shops and smart shops were of minor informative value.<sup>1</sup> Employers, colleagues and specialized

<sup>1</sup> A **coffee shop** is an alcohol free cafe establishment where soft drugs are sold and used (in The Netherlands). **Smart shops** are shops that sell so called eco-drugs (XTC substitutes, euphoric and relaxing substances), energy drinks and the like, and where there are sometimes facilities for the use of these drugs. Until recently, these shops also sold magic mushrooms (again in the Netherlands), but this is now prohibited. **Grow shops**, also known as head shops, are shops that sell the equipment necessary for growing cannabis at home, and paraphernalia for smoking cannabis (such as hash pipes).

cannabis fairs were also among choices, but they were not seen as important sources of information by these respondents.

#### *5.4. Profit and destination of the cultivation*

The average yield from one plant among these growers was 56.8 grams (the median: 50 grams). The minimum harvest of one plant was 1 gram, the maximum, according to one respondent, 127 grams. As can be expected,<sup>3</sup> the average yield per plant among outdoor growers was larger than among indoor growers, although the difference in this sample is less spectacular than might have been expected: outdoor cultivators harvested an average of 63.7 grams per plant (median: 50 grams), indoor growers got on average 48.8 grams from one plant (median: 40 grams). Fully 40.7% of the respondents (n=268) were unable to state the average yield per plant.

In most cases, the whole yield (or the major part) of home-grown cannabis was intended for personal consumption (see Table 2). Seventy-one respondents (12.2% of the respondents able or willing to answer) claimed that their entire harvest (100%) was for personal use. Seven respondents (1.2%) consumed nothing of their harvested cannabis themselves. Seven others (another 1.2%) smoked, in their very own words, less than 5% of the self-grown cannabis. Of these fourteen cultivators, four gave their entire harvest away to friends, and five shared at least half with friends. One respondent sold his harvest for medicinal purposes. Finally, one grower cultivated on commission: he sold 95% of his harvest that way.

Twelve respondents (2.1% of the respondents who replied) stated they cultivated cannabis by order. Two out of three claimed thus selling 20% or less of their harvest; the others sold more, respectively 30%, 50%, 60% and 95%.

On average, 67.2% of the cannabis harvested by our participants was intended for personal use, and another 22.8% was given away: mostly to friends (19.3%), and on occasion

**Table 2 Destination of the harvested cannabis, in percentages \***

Percentage that the respondents...	0 %	1-25%	26-50 %	51-75%	76-99%	100%	Average	Median
Smoke themselves	1.2	9.8	21.1	22.5	33.2	12.2	67.2	75
Hand out to friends	20.0	54.0	22.5	1.9	1.0	0.5	19.3	15
Sell to friends	77.7	17.4	4.3	0.5	0.2	-	4.3	0
Sell to acquaintances	83.5	12.7	3.1	0.5	0.2	-	3.0	0
Hand out to acquaintances	78.9	19.9	1.0	0.2	-	-	2.4	0
Sell to anyone who asks	94.0	5.0	0.7	0.3	-	-	1.0	0
Hand out for medicinal use	93.6	6.0	-	0.3	-	-	0.7	0
Cultivate by order and deliver for money	97.9	1.4	0.3	0.2	0.2	-	0.5	0
Hand out to anyone who asks	95.0	5.0	-	-	-	-	0.4	0
Sell for medicinal use	98.6	1.2	-	-	-	0.2	0.2	0
<b>Total</b>							<b>100.0</b>	
<i>I do not wish to answer this question</i>	20							
<i>Void</i>	57							
<b>Total</b>	<b>659</b>							

\* Total number of valid answers: 582 (88.3% of the participants); total number of *missing values*: 77 (11.7% of participants).

Note: This table is based on a structured question with structured response categories. Respondents could tick the answer 'I do not wish to answer this question'.

to acquaintances (2.4%), anyone who asks (0.4%) or for medical use (0.7%). Very little of the cannabis harvested by our respondents is sold (9.0%) to friends, acquaintances or others.

Three out of four respondents (73.7% of the sample) claimed that home cultivation was sufficient for their personal consumption. However, more than half of the respondents (56.6%) bought additional small amounts of cannabis, in most cases less than 10 grams a month. Some respondents bought extra cannabis because they wanted to smoke a different variety of cannabis or because they occasionally liked to smoke some hash (instead of marihuana). Others, especially outdoor growers, bought additional cannabis because they had run out of personal supply and they need it to tide them over till their next harvest.

The majority of the participants (68.0%) claimed they never sold any home-grown cannabis. Those who did sell only did so when the harvest exceeded their personal needs, and usually to a small number of people (5 to 6) they knew intimately. On average they earned 394.5 euro (most recent cultivation). This amount was strongly affected by a few ‘outliers’: the median is 60 euro.

### *5.5. Advantages and disadvantages of cannabis cultivation*

There is usually more than one reason for starting to grow cannabis, but our survey shows that financial benefit (cheaper marihuana), curiosity (checking out if it is really that easy), and the pleasure of growing (‘green fingers’) are the most important reasons (see Table 3). The commercial motive (growing for profit) plays a minor role.

**Table 3 Motives for cultivating cannabis \***

	Not important	Neither important, nor unimportant	Important	Average
Home-grown cannabis is cheaper <sup>[620]</sup>	10.8	10.2	79.0	4.23
To provide for personal use <sup>[603]</sup>	12.2	13.8	74.0	4.04
Growing is fun ('green fingers') <sup>[603]</sup>	21.3	23.2	55.4	3.58
Curiosity ('for the sake of the experiment') <sup>[607]</sup>	28.3	21.6	50.1	3.34
Home-grown cannabis is healthier ('I wanted organic weed') <sup>[594]</sup>	35.4	17.3	47.3	3.20
To avoid the 'illegal' circuit ('street vendors', etc.) <sup>[577]</sup>	40.0	16.1	43.6	3.04
Because of the beauty of the plant <sup>[577]</sup>	37.6	22.2	40.2	3.04
Because it is easier ('you don't need to travel') <sup>[592]</sup>	37.2	22.5	40.4	3.01
Because it is less risky ('you avoid the risk of being controlled at the border') <sup>[575]</sup>	44.2	19.7	36.2	2.82
To share cannabis with friends and acquaintances <sup>[565]</sup>	67.8	19.8	12.4	2.05
Home-grown cannabis is milder ('weed bought elsewhere is too strong') <sup>[570]</sup>	64.7	15.8	19.5	2.13
To sell cannabis <sup>[554]</sup>	90.0	4.9	5.0	1.38
<i>I don't wish to answer to this question</i>	<i>12</i>			
<i>Void</i>	<i>39</i>			

\* The number of valid answers per motive is in small captions and between square brackets in the left column

Note: This table is based on a structured question with structured response categories. Respondents could tick the answer 'I do not wish to answer this question' or 'other'. When respondents ticked the latter, they were allowed to explain their choice in a string variable, allowing for 250 characters. These answers were recoded afterwards.

A number of growers started cultivating cannabis because they were not satisfied with the quality (too strong, too chemical, ...) of the marihuana sold in Dutch coffee shops. Better

**quality** (‘healthy’ and ‘organic’) and **avoiding the illegal circuit** were considered the major advantages of home cultivation. We shall come back to this finding in the next paragraph.

For many participants, growing one’s own cannabis had become a relaxing pastime. After a while, many growers got ‘green fingers’ and began to take pride in being able to grow their own. Many growers subsequently came to realize that the cultivation of cannabis also offered interesting financial possibilities, which became an additional motivation to continue cultivating cannabis. For some, home cultivation was also a way of reducing or avoiding the risk of getting caught at the border or at police controls. Not having to travel to the Netherlands was an additional major convenience.

**Table 4 Advantages of cultivation\***

	Not important	Neither important, nor unimportant	Important	Average
Personal use is cheaper <sup>[550]</sup>	8.0	6.5	85.5	4.46
Green fingers (tending and harvesting the plant) <sup>[529]</sup>	21.2	21.2	57.6	3.64
Feeling of achievement (one’s own product) <sup>[523]</sup>	27.9	22.2	49.9	3.30
Convenience: no travelling <sup>[517]</sup>	30.8	24.2	45.1	3.23
Superior quality/flavour of home-grown cannabis <sup>[495]</sup>	31.1	23.8	45.1	3.20
Avoiding the illegal circuit <sup>[507]</sup>	39.2	16.2	44.6	3.07
Lower risk of getting caught <sup>[502]</sup>	45.4	18.7	35.8	2.80
Social aspect: doing others a favour <sup>[493]</sup>	55.5	22.9	21.5	2.44
Financial gain by selling <sup>[475]</sup>	82.7	8.8	8.4	1.58
<i>I don’t wish to answer to this question</i>	7			
<i>Void</i>	90			

\* The number of valid answers per advantage is in small captions and between square brackets in the left column.

Note: This table is based on a structured question with structured response categories. Respondents could tick the answer ‘I do not wish to answer this question’ or ‘other’. When respondents ticked the latter, they were allowed to explain their choice in a string variable, allowing for 250 characters. These answers were recoded afterwards.

Most disadvantages of domestic cultivation were related to the risk of getting caught (see Table 5), the strong smell and the annoying noise produced by the equipment. Furthermore, storing a large quantity of cannabis presented a problem, not only because of the consequences when caught by the police, but also because of the possible impact on the grower's personal consumption pattern: 18.8% defined the impact on their personal consumption (they claim they would smoke more) as a major disadvantage.

The cultivation of cannabis was considered a labour-intensive and a time-consuming activity by 39.3% of the interviewees. According to 71.6% of the respondents, these disadvantages played a minor role.

**Table 5 Disadvantages of cultivation\***

	Not important	Neither important nor unimportant	Important	Average
The risk of being caught <sup>[521]</sup>	41.5	18.0	40.5	2.97
Disappointing harvest <sup>[527]</sup>	38.7	25.4	35.8	2.91
Large quantity of cannabis in the house <sup>[511]</sup>	42.4	22.3	35.3	2.81
Inconvenient smell <sup>[509]</sup>	60.0	20.8	19.3	2.25
'You will smoke cannabis' <sup>[484]</sup>	66.8	15.3	18.0	2.09
Lack of space <sup>[480]</sup>	66.3	16.0	17.7	2.06
Time-consuming character of cultivation <sup>[490]</sup>	71.6	16.9	11.4	1.94
Friends wanting to profit from the harvest <sup>[474]</sup>	78.0	14.6	7.4	1.69
Noise of the equipment <sup>[449]</sup>	92.7	4.5	2.9	1.29
<i>I don't wish to answer to this question</i>	5			
<i>Void</i>	97			

\* The number of valid answers per disadvantage is in small captions and between square brackets in the left column.

Note: This table is based on a structured question with structured response categories. Respondents could tick the answer 'I do not wish to answer this question' or 'other'. When respondents ticked the latter, they were allowed to explain their choice in a string variable, allowing for 250 characters. These answers were recoded afterwards.

The main problems our respondents encountered included seeds failing to germinate, the presence of male plants (which do not produce flower buds) and, of course, mould and plant lice. One fourth of the respondents mentioned having bought cuttings of bad quality. Moreover, most cultivators feared threats and theft of cuttings more than discovery by the police. Wouters et al. (2007) have suggested that security measures taken by cultivators are sometimes more inspired by the risk of being discovered by other cultivators or by consumers than by the fear of being caught by the police. Besides, the major part of the respondents (72.4%) considered actually getting caught by the police quite or very unlikely.

#### *5.6. Quality and strength of home-grown cannabis*

We have mentioned above that many growers started cultivating because they were not satisfied with the quality (too strong, too chemically boosted...) of the cannabis bought in Dutch coffee shops. Whether or not home-grown cannabis is different in terms of strength (THC-content) or quality (pollution) from 'commercial' cannabis sold at Dutch coffee shops or elsewhere is impossible to verify in our data, but the subjective perception of these growers may be an important aspect.

Almost one out of three respondents (31.8%) perceived his or her self-cultivated cannabis as 'strong' or 'very strong', 28.2% as 'mild' or 'very mild', and 40.0% as 'neither strong, nor mild'. One out of ten (n=45; 9.1% of the sample) claimed that their home-grown cannabis was **stronger** than cannabis bought elsewhere. Of these 45 respondents, 47.5% stated that this had no impact on their own pattern of consumption and 45.0% that they consumed (a lot) less cannabis because of this. A majority of these cultivators (n=308; 64.6% of the sample) thought that their own cannabis was **milder** than cannabis bought elsewhere. In this group, 72.8% claimed this had no impact on their pattern of consumption, 19.8% that they consumed more, and 8.3% that they smoked less cannabis. Of the 143 respondents who

believed that their own self-cultivated cannabis was as strong (or as mild) as the cannabis bought elsewhere, 81.8% stated (as can be expected) that this did not influence their pattern of consumption. Nevertheless, 9.8% consumed more, and 8.3% less cannabis.

It is important to note that respondents were more concerned with differences in ‘quality’ between home-grown cannabis and cannabis bought elsewhere than with possible differences in ‘strength’. They were more interested in a ‘healthy’, ‘organic’ product than in a ‘milder’ product. In other words, home growers seem to be more worried about unhealthy substances (pesticides, moulds, etc.) in the cannabis bought elsewhere (including in Dutch coffee shops), than about the ‘strength’ of the product (which for many consumers refers to the level of THC in the product).

## **6. Conclusions**

In this contribution we have presented some significant findings from a large-scale study on a segment of the market, small-scale cultivators, which is less visible (both to the police and to the media) and less studied. The internet is a useful avenue to obtain data on a sensitive topic such as cannabis cultivation, as cannabis growers are a ‘hidden population’. On the other hand, the sample of cannabis growers we reached through this web survey is clearly a convenience sample, and our results cannot be generalised to the larger population of Belgian cannabis cultivators. Although we tried to avoid or detect as many possible biases according to methodological standards for internet based research (see above), the quality of our data is undoubtedly compromised because of coverage error, volunteer effects and other factors.

It may be impossible to determine the degree and the importance of bias in our sample (Coomber, 1997), but it remains useful for developing hypotheses and for performing qualitative analyses (Schonlau et al., 2002). As the objectives of the study were of a qualitative nature (rather than measuring the extent or the prevalence, we wanted to study the variation among cannabis cultivators and different motives for growing cannabis), the non-representative nature of the sample is less relevant here. The importance of our data is that they show important differences between key characteristics (motives for growing) of this sample obtained online with those obtained through traditional methods in other studies. Our paper has illustrated how this web survey attracted a sample of ‘small scale’, ‘amateur’ and often less experienced cannabis growers (‘new’ growers may be the ones who are likely to be actively looking for information on how to grow cannabis, both on the internet and in specialised magazines). Our data do not allow for conclusions on the exact market share and role of different types of cannabis producers. However, our data do suggest that small-scale home growers constitute a significant segment of the cannabis market, both in a quantitative and in a qualitative perspective.

First of all, the fact that in spite of our modest (financial) means and limited research techniques (face-to-face interviews with 89 cultivators, and 659 cultivators interviewed anonymously through the web survey) we managed to reach 748 cultivators in a relatively short period of time, indicates that the real number of cultivators in Belgium must be significant. We may assume that Belgium has about 200,000 (regular) consumers of cannabis (Bayingana, Demarest, Gisle, Hesse, Miermans et al., 2006). A earlier study we conducted among 369 experienced users of cannabis in Belgium, showed that 7.3% of the respondents were growing cannabis at the time of the interview, and that 29.8% admitted having done so in the past (Decorte, Muys & Slock, 2003). Assuming that both findings are reliable, there are about 15,000 amateur growers in Belgium (and at least 60,000 people have experimented with

the cultivation of cannabis at least once). Admittedly, these estimates are highly speculative, but if they contain some truth, small-scale domestic cultivation constitutes a substantial share of the entire cannabis market. Small scale, ideologically oriented cannabis growers may be ‘back in business’ (Potter, 2006), and if that is true, in the absence of more empirical evidence their market significance should not be underestimated (Bouchard, 2007).

More importantly, small-scale cannabis production should in our opinion be regarded as a significant segment of the cannabis market, not only because considerable numbers of cultivators are involved, but also because of a number of specific characteristics of these producers. If any indoor growing operation that uses sophisticated and efficient cultivation techniques (such as artificial lighting, or the use of nutrients and pesticides), or to the use of technical equipment (timers, ventilators, carbon filters, air filters, temperature and humidity regulating devices, etc) is labelled as professionalization, a large number of small-scale growers appear to become more ‘professional’ during their growing career, even if they are not explicitly profit-oriented. Elementary knowledge of cultivation techniques is not (or no longer?) the monopoly of a small group of cannabis connoisseurs and large-scale cannabis producers. Through the internet, word-of-mouth among friends and acquaintances, specialized magazines and manuals, and grow shops, know-how and professionalization may have become important characteristics of small scale ‘amateurs’, whereas these features are usually ascribed to large scale ‘professionals’ (‘criminals’) (Plecas et al., 2002; Bouchard, 2005).

Another noteworthy characteristic of small-scale cannabis growers is their preoccupation with the strength and the quality of the cannabis they grow in comparison with the cannabis they buy elsewhere. Most of the cultivators we recruited through the web survey claimed their own cannabis was milder than the cannabis bought elsewhere (e.g. in Dutch coffee shops). In this light, the hypothesis that there is a difference in strength (i.e. THC-content) between

cannabis grown locally by professional, commercially oriented, large-scale producers and cannabis grown locally by small-scale, more idealistic cultivators, needs to be tested scientifically. But heedful of the dictum that ‘if men define situations as real, they are real in their consequences’, we note that the idea that home growers perceive their cannabis to be milder may have important consequences, both for their personal patterns of consumption, and for policy strategies.

The findings presented above also suggest that many small-scale domestic cultivators grow cannabis because they are not satisfied with the cannabis products sold by Dutch coffee shops: too ‘strong’ and ‘chemically boosted’. These users want a ‘milder’, ‘healthier’ and ‘more organic’ product. Our findings illustrate this quest for a product of higher quality in several ways. Not only is this desire for ‘organic weed’ an important motive to grow cannabis, some growers try to refine their cultivation techniques for the same reason. Although they are not looking for monetary gain, many home growers start using ‘professional’ equipment, both to enhance their yield and to improve the quality of their cannabis. When growers give each other advice and tips, they often emphasize ‘organic’ growing strategies to keep their cannabis free from mould, bacteria, heavy metals and insecticides.

Whether true or not, the stories on dishonest practices (like charging [loading] the cannabis with water in order to cash more kilos, adding chemical supplements, using poison against mite and other diseases, or adding all kinds of supplements to improve the appearance of the cannabis) may help explain why many Belgian users became dissatisfied with the strength and the quality of the cannabis they used to buy in Dutch coffee shops. Together with the dominant discourse on extremely high THC-percentages in Dutch cannabis (and the psychological dangers related to them), and the fact that growing cannabis is actually not very difficult (and the minimum know-how easily accessible) this might have stimulated more

users to grow their own 'organic' cannabis. In his study, Potter (2006) argued that these non-commercial growers reflect consumer-driven market concerns: the idea that consumers can have a significant impact on the way in which a product is produced and marketed, in particular that non-commercial growers do not want to be contributing to the profits of criminals and want to ensure the quality of the cannabis they are smoking.

Potter (2006) argues that even though large scale commercial growers (whose overriding aim is almost exclusively profit-orientated) may not appear to be motivated by the ideological concerns of the wider cannabis culture, many of their consumers and hence the driving forces of their profiteering are immersed in that culture and the pressure is on even the largest corporate growers to produce good quality cannabis. True, the concept of 'organic weed' has also spread through the Dutch coffee shops and other distributors: nowadays some varieties of cannabis are sold as 'organic weed' ('bioweed'). The experience of commercial growers (see Maalsté & Panhuysen, 2007), however, indicates that this is probably a smart marketing strategy applied by opportunistic producers and distributors. Whether the 'organic weed' in the Dutch coffee shops really is any more 'organic' (read: 'healthy') than other varieties, is unclear and even doubtful.

In the absence of more detailed research on the size and the significance of different segments of the cannabis market, it remains difficult to evaluate the empirical value of the hypotheses put forward by researchers. Any attempt to understand the transformations of the cannabis market will need to take into account the whole range of individuals involved and their attitudes and motivations, and the variety of sizes, structures, and types of cannabis distribution operations. Many authors have argued that cannabis markets have the least unacceptable consequences if criminal entrepreneurs do not crowd them (Dorn & South, 1990; Jansen, 2002; Hough et al, 2003; Gettman, 2006; Decorte, 2007). Perhaps the most pressing policy issue raised by our study and those of others relates to the differential impact

of government policies on different segments and networks of the cannabis production market.

## **Endnotes**

<sup>1</sup> This can be obtained from the author on request.

<sup>2</sup> According to Internet World Stats, the internet penetration (in June 2009) was 50.1% in Europe, 60.1% in Oceania/Australia and 73.9% in North America. Internet penetration in Belgium was 67.3%, which is higher than in Germany (67.1%), Italy (50.1%), Portugal (41.6%), Greece (45.9%), Hungary (55.5%), but lower than in Austria (68.2%), the Netherlands (85.4%), France (67.7%), Luxembourg (74.0%), the United Kingdom (79.8%), Sweden (80.5%), Finland (82.9%), Norway (85.7%), Spain (70.6%), and the same as in Ireland (67.3%). Source: [www.interworldstats.com](http://www.interworldstats.com)

<sup>3</sup> Indoor cultivation does allow for climate control and more specialist horticultural techniques, but it is often more restricted in space. The more plants are placed under one lamp, the smaller the yield.

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