

LIFE + Information & Communication

AlterIAS Project

ALTERnatives to **I**nvasive **A**lien **S**pecies

Regulation and self-regulation instruments to prevent deliberate introductions of invasive alien plants

A review with a focus on voluntary approaches

Discussion paper

- March 2014 -

This discussion note was developed within the framework of the AlterIAS LIFE+ project. The note aims at presenting a comparative overview of the potential effectiveness of regulation and self-regulation tools on invasive alien plants (IAP), with a focus on self-regulation based on the feedback of the voluntary Code of conduct implemented in Belgium. The mandatory vs. voluntary approaches are discussed on a theoretical and bibliographical point of view in order to provide guidance for policy strategies. To conclude, different voluntary approaches on IAP under application are presented and compared.

AlterIAS - **ALTER**natives to **Invasive Alien Species** - was a communication project dedicated to invasive plants and prevention within the horticultural sector in Belgium (<http://www.alterias.be>). AlterIAS [2010 – 2013] was supported and co-financed by the LIFE + program of the European Commission and by regional and federal administrations responsible for environment in Belgium (SPW-DGOARNE, ANB, IBGE-BIM, SPF-SPSCAE-DG Env). The project was coordinated by the Biodiversity and Landscape Unit from the University of Liège Gembloux Agro-Bio Tech (ULg GxABT), in collaboration with the Centre Technique Horticole (CTH) and the Proefcentrum voor Sierteelt (PCS).

INTRODUCTION

Prevention is recognized as an effective option to reduce the introduction and spread of invasive alien plants (IAP) which is considered as one of the most challenging ecological problems of the 21st century (Yi *et al.*, 2006). Prevention aims at reducing the rate of occurrence of both initial introductions (i.e. new introductions) and secondary introductions (i.e. secondary releases, *sensu* Kowarik, 2005) of IAP used as ornamentals. Ornamental horticulture is indeed widely acknowledged as one of the main introduction pathway of invasive plants (Reichard *et al.* 2001; Burt *et al.* 2007; Dehnen-Schmutz *et al.* 2007).

Preventive actions are considered as much more effective than control actions because of a higher cost/benefit ratio from both an ecological and economical perspective (Vanderhoeven *et al.*, 2011). Preventive actions may include regulation and/or voluntary instruments (i.e. self-regulation), in addition to other strategies such as education, awareness-raising program, risk analysis, early detection, surveillance and rapid response. The last decades has seen a considerable increase in the use of voluntary approaches to environmental protection, with a growing literature dedicated to the description of voluntary vs. mandatory approaches (Alberini *et al.*, 2002). Voluntary tool are based on the principle of self-regulation (i.e. everyone is free to endorse it) which contrasts with the compulsory principle of mandatory instruments. Voluntary approaches cover a large variety of different arrangements, referring to a rich terminology including self-regulation, voluntary initiatives, voluntary codes, environmental charters, voluntary accords, voluntary agreements, co-regulation, covenants, negotiated environmental agreements (Börkey *et al.*, 2000).

In accordance with Börkey *et al.*, we use in this note a broad definition of voluntary approaches (VAs) which are defined as voluntary commitments of the industry in order to pursue actions leading to the improvement of the environment. Recent surveys mention over 300 negotiated agreements in the European Union countries (and the number is still increasing), about 40000 local pollution control agreements in Japan and over 40 voluntary programs managed by the US government at the federal level (Ten Brink, 2002). Voluntary approaches deal with a wide range of environmental issues related to different sectors of economic activity: chemical industry, energy, forestry and wood, fishery, mining and metals, tourism and travel, etc.

More recently, VAs such as Codes of conduct have been used in the horticultural sector to deal with the introduction of IAP. According to Moss *et al.* (2005), the aim of a national voluntary approach on IAP would be for an industry funded and managed scheme to engage the retail, propagation and distribution industry members in an effort to persuade them to voluntarily remove certain high-risk species from their stock. In Europe, the Code of conduct on horticulture and invasive alien plants has been published in 2008 by the European and Mediterranean Plant Protection organization and the Council of Europe (Heywood *et al.*, 2011). Following this publication, a survey conducted in 2011 by the European Plant Protection Organization reported 12 national initiatives on Codes of conduct on invasive alien plants (EPPO reporting service n°6 and 7, 2011). VAs are recommended in the European strategy on IAS (Genovesi *et al.*, 2011) and in the new EU regulation on IAS which encourages the implementation of self-regulation tools in addition to regulation instruments.

REGULATION AND SELF-REGULATION TOOLS ON INVASIVE ALIEN SPECIES: A REVIEW

Two main strategies are commonly used to prevent deliberate introductions of invasive alien species (IAS): regulation (often called 'command and control', *sensu* Moss *et al.*, 2005) and/or self-regulation (i.e. voluntary approaches). Self-regulation tools such as Codes of Conduct have an additional goal of awareness-raising.

In the various European countries a complex, fragmented and continually developing network of legislative instruments and regulations is in operation aiming at preventing the introduction and spread of IAS that pose a threat to native species and ecosystems and to agriculture, fisheries, forestry and horticulture (Miller *et al.*, 2006, quoted by Heywood *et al.*, 2013). Many countries have regional or national legislation aiming at preventing possession, transport, trade or release in the wild

of specific invasive alien plants (Heywood *et al.*, 2011)¹. According to Heywood *et al.* (2013), they cover a wide diversity of approaches (see review by Shine *et al.*, 2010). On the other hand several Codes of conduct or Codes of practice on IAS are implemented throughout the world. The first voluntary approaches being the Garden Plants Under the Spotlights Strategy (GPUTS) developed in Australia in 1999 (Roush *et al.*, 1999; quoted by Moss *et al.*, 2005) and the St. Louis Code of conduct for nursery professionals implemented in the United States in 2002 (Reichard, 2004). Since these first initiatives, several Codes have been implemented in other countries (e.g. Belgium, Denmark, Estonia, Ireland, Liechtenstein, Norway, Poland, Slovakia, Slovenia, Spain, the Netherlands, the Great Britain)². As recommended by Heywood *et al.*, (2011), Codes of conduct and self-regulation should be considered as a first step that, if not successful, may lead to regulation³. Voluntary schemes are seen as a practical alternative to mandatory approaches that impose strict regulations that may be onerous and face stiff opposition from the sectors they affect (Alberini *et al.*, 2002, quoted by Vanderhoeven *et al.*, 2011).

Despite common goals, the scope and impact of voluntary vs. mandatory tools on stakeholders may differ, with advantages and drawbacks, incentives and constraints. On top of this, the effectiveness and efficiency of both regulation and self-regulation tools on IAS are poorly documented due to the lack of monitoring implemented once these instruments are applied.

A recently raised question considering the new EU regulation

Although some EU countries have legislation on IAS to protect their national biodiversity, there is no harmonized approach across the EU. Considering the need for coordinated actions, the Commission proposed in 2008 a number of possible options for an EU strategy on invasive species. These include maximizing the use of existing legislation together with voluntary measures. In 2013, the European Commission has published a proposal for a regulation on the prevention and management of the introduction and spread of IAS⁴. The proposal is for three types of interventions; prevention, early warning and rapid response, and management.

¹ Several examples of regulation are provided by Heywood *et al.* (2011). For instance, in 1999, a specific legislation was prepared in Portugal to address IAP. A list of 32 plant species are listed as invasive by this law and cultivation, detention in a confined place, use as an ornamental plant, release, sale, exchange and transport are prohibited (with penalties applied if disregarded). Inspections of the horticultural sector are planned for the implementation of this regulation. In the United Kingdom, a regulation (i.e. Schedule 9 of the UK Countryside and Wildlife Act 1981) lists plants that cannot be planted or caused to grow in the wild. The list was updated for Scotland in 2005 and now includes nine invasive aquatic plants and four terrestrial plants. In Belgium, a regulation instrument (i.e. the « Circulaire wallonne » related to invasive alien plants) is under application the Walloon region (i.e. Southern Belgium). The law dated from 2009 and has been revised in 2012 once the Belgian Code of conduct on invasive plants (Halford *et al.*, 2011) was approved. At present, this law bans intentional plantations of 28 invasive plant species within the frame of public tender procedures (i.e. 'cahiers spéciaux des charges') submitted by the public departments from the Wallonia Public Service. In the Brussels region, the new "Ordonnance" related to nature conservation was voted in January 2012. The regulation includes a chapter dedicated to IAS and prohibits the trade, planting and transport of invasive alien species listed in the *Harmonia* information system (<http://ias.biodiversity.be>).

² Countries mentioned in the survey on Codes of conduct on horticulture and invasive alien plants conducted by EPPO (EPPO reporting service n°6 and 7, 2011). The survey was addressed to the 50 National Plant Protection Organizations of the EPPO region, the Ministries of the Environment of the Council of Europe Member States, NGOs and the general public. This survey yielded 33 answers from 22 countries. Among the respondents, 2 were representatives of Universities, 4 were from NGOs, 9 were from NPPOs and 18 were from Ministries of Environment, the two latter institutions being fused in some countries. Among the 28 persons who were aware of the existence of the CoE/EPPO Code of conduct (Heywood *et al.*, 2011), 12 reported national initiatives involving Codes of conduct either on-going or planned. Codes are also implemented in non European countries such as Australia, the United States and New Zealand.

³ Moss *et al.* (2005) reported the failure of a voluntary approach implemented in New Zealand (i.e. the Industry Standard for the garden sector) which was a catalyst for the decision to legislate. The Industry Standard was initially accompanied by a Forest Friendly Award Scheme whereby a nursery received a certificate and favourable media if they complied with the standard. Despite some initial success, the scheme failed to engage the large retailers. While supported by many quarters of the garden industry, the resistance of some major retail chains led to the failure of this voluntary measure and the government decision to implement national legislative bans on the sale of high-risk invasive plant species. The ensuing legislative ban was negotiated with the industry. The change from a voluntary mechanism to compulsory regulation had an immediate impact upon industry. The new legislative regime following the failure of the voluntary approach has been described as empowering, consultative, equitable and successful in addressing the problem (Moss *et al.*, 2005). However, the authors conclude that voluntary measures have some positive benefits in terms of education and awareness-raising, and should be used as part of a comprehensive policy mix.

⁴ http://ec.europa.eu/environment/nature/invasivealien/index_en.htm

The question of voluntary vs. legislative instrument on IAS has been recently raised during the IUCN conference 'Invasive Alien Species: the urban dimension' held in Switzerland on September 5th 2013. Considering the new EU regulation on IAS under preparation, the conference dedicated an out-break session to this specific issue. Voluntary codes of conduct and best practices are considered as fundamental flexible "implementation" tools, which could be scaled up with support from public bodies, industry federations, user groups and/or NGOs as appropriate, with the aim of ensuring responsible, proactive policies, and applying these in a coherent manner across Europe. A voluntary code of conduct can clearly fulfill multiple roles: awareness-raising, stimulating stakeholder involvement, leverage/dissemination of best practices, supplementing existing regulations or filling a regulatory gap (Shine *et al.*, 2010, quoted by Scalera *et al.*, 2013). The main outcomes of the out-break session could be summarized as follows:

- the EU legislation deals with the worst part of the problem but needs to be complemented by voluntary measures;
- legislation may trigger voluntary action (e.g. for species not listed as priority);
- some aspects however do need a mandatory approach;
- the code of conduct is useful for less fundamental aspects and can help to implement the legislation ;
- the voluntary approach is as strong as the ideas, needs and willingness of people;
- even with legislation in place, imports for commercial purposes are not always inspected;
- legislation is not a complete answer to find solutions for the problems;
- the EU legislation will present an equal ground for all;
- in absence of legislation, a code of conduct can inform or prepare a sector for future legislation or when legislation is missing;
- however legislation is required, because economic or personal gain may lead to breach of the code of conduct and many continue on the same path as before the code was established.

General characteristics of voluntary approaches and regulation instruments

According to Börkley *et al.* (2000), three main types of voluntary approaches are distinguished in the literature: (1) unilateral commitments; (2) public voluntary schemes and (3) negotiated agreements (see frame below). Public voluntary scheme and negotiated agreements (or sectorial agreements) are more frequently used to address the specific issue of IAP. However some VAs (such as the Belgian Code of Conduct on invasive plants) are hybrid forms between these two types (i.e. approaches initiated by public authorities but developed in consultation with the horticultural sector).

The three types of voluntary approaches

Unilateral commitments consist of environmental improvement programs set up by firms themselves and communicated to their stakeholders (Börkley *et al.*, 2000). Such actions are often termed "business-led initiatives," "corporate environmentalism," or "industry self-regulation." Under these programs, measures are initiated by the sectors themselves. While public authorities can applaud and assess these efforts, they do not play an active role in their design (Alberini *et al.*, 2002).

Public voluntary scheme (or voluntary government program) includes approaches where firms agree to standards developed by public bodies such as environmental agencies (Börkley *et al.*, *op. cit.*). In this type of voluntary instrument, the regulatory agency unilaterally determines both the rewards and obligations from participation, as well as the eligibility criteria. The regulatory agency designs the program, and then seeks participation given the terms it specifies (Alberini *et al.*, *op. cit.*).

Negotiated agreements are contracts resulting from negotiations between public authorities (national, federal or regional) and industry. The contracts may be legally binding or non-binding. Unlike the two former types of voluntary approach, the contents of negotiated agreements are defined not unilaterally by either industry or public bodies, but jointly by both (Börkley *et al.*, *op. cit.*). It is therefore a bilateral agreement between the two partners with respective obligations. A legal framework is needed to conclude such agreements.

Voluntary approaches are generally not legally binding (i.e. with no penalties if disregarded). Some instruments may have signatories⁵. Signed Codes involve a voluntary and moral commitment from an organization or a firm to implement the agreement. Such Codes are different from codes of conduct or codes of practice that give guidelines on good practices and where no commitment is taken (Sonigo *et al.*, 2011). Other Codes propose general guidelines or species-specific recommendations, which in turn may be negotiated (or not) in consultation with the horticultural sector. Finally, Codes are implemented with or without a communication campaign depending on the human and financial resources available within the program. Therefore, the potential success of all these forms of Codes is variable. Codes are flexible tools easy to revise through a consultation process with partners. It can be quickly negotiated and implemented at a national level. The number of partners is unlimited.

Negotiated agreements⁶ are conventions signed between the government and one or several organizations or firms (see frame above). The contracts may be legally binding or non-binding (Börkey *et al.*, 2002)⁷. In Southern Belgium (i.e. Wallonia), negotiated agreements are legally binding and include penalties if disregarded. Negotiated agreements are less flexible tools than public voluntary schemes: procedures of adoption and modifications are heavy (incl. preliminary surveys, communications to the Parliament, publication in the "Moniteur Belge", etc.). The geographical scope is limited (Misonne *et al.*, 2011). The number of partners is also limited, depending on the number of firms which have signed the convention. The best example of negotiated agreement on invasive plants is the 'Covenant Waterplanten' under application in The Netherlands since February 2010⁸. This instrument targets the trade of invasive aquatic plants (see more description below). The 'Covenant Waterplanten' is not legally binding (Verbrugge, pers. comm., 2013).

On the other hand, regulation tools are mandatory and legally binding (with penalties if disregarded). Such tools are obligatory and applicable to everyone concerned with the scope of the legislation (i.e. following the principle stating that "no one is supposed to ignore the law"). Regulation instruments are often voted unilaterally and therefore suffer from a lack of support from the horticultural sector. Regulations may be stronger tools (i.e. more restrictive), but needs more time to be implemented. Several years of preparation are often required before being voted. Legislation are less flexible than VAs (i.e. more difficult to revise) and have a limited geographical scope of action (i.e. regional or federal/national level) depending on the scope of the public authority who initiated the law. Different introduction pathways may be regulated (i.e. trade, planting, importation, transports, etc.) according to the competences of the public authority responsible for the regulation. It must also be noted that legislations may remain totally ineffective without appropriate communication and control (i.e. inspections). Indeed, a law that nobody knows and nobody controls is expected to be inefficient.

The specific issue of invasive alien plants and the horticultural sector

In the United States, both regulation and self-regulation tools on IAP have had limited effectiveness in the horticultural sector because these approaches did not address the industry's complexities and economic incentives (Drew *et al.*, 2010). Recently, much attention has been given to industry self-regulation. With a growing willingness to assume responsibility and avoid more intrusive legislative regulation, the industry has made cooperative efforts with other agencies to develop and adopt a set of Voluntary Codes of Conduct for Nursery Professionals (Baskin, 2002; Gagliardi *et al.*, 2007, quoted by Drew *et al.*, 2010). According to Drew *et al.* (2010), self-regulation will fail without imposing sanctions or other formal/informal means of coercion, because it does not address the moral hazard problem where agents tend to act in their self interest (due to the motivation by profit related to the business) when there is a low risk of penalty or loss of reputation. They conclude that involvement

⁵ For instance, in England, Wales and Ireland, the Codes of practice provide general guidelines. It is not a charter to sign. In Belgium, France, The Netherlands and Germany, the Codes must be signed.

⁶ In French "convention environnementale" or "accord de branche" (terminology used in Belgium according to Misonne *et al.*, 2011).

⁷ Binding agreements are the exception rather than the rule in the European Union. The only member state where agreements are systematically binding is The Netherlands (Börkey *et al.*, 2002).

⁸ The Netherlands is one the most pro-active European member state in the implementation of negotiated agreements (called 'covenants'). In 1997, 107 covenants were in force in this country (compared to 6 in Belgium), covering all major polluting industries (Börkey *et al.*, 2002).

and education of consumers may provide better oversight outcomes by addressing the moral hazard problem while acknowledging the key characteristics of the industry.

Other authors call for stronger federal regulations and enforcement in addition to the Codes (Reichard, 2005, quoted by Drew *et al.*, 2010). This option is in line with a complementary approach between Codes of conduct and legislation. In some cases, legislation can reinforce voluntary Codes. However the implementation of both regulation and self-regulation requires a coherent policy ensuring the compatibility of instruments. Subsequently it requires a strong collaboration between policy-makers in order to guarantee that laws voted at a regional or federal level are coherent (i.e. will not interfere) with voluntary instruments under application at the same level. Heywood *et al.* (2011) consider that the principle of self-regulation is likely to be more successful and effective than any legally binding scheme. According to Burt *et al.* (2007), self-regulation by the horticulture trade has the potential to be successful for several reasons. First, the horticulture trade deals primarily in non-essential commodities, and in both ornamental landscaping and erosion control, equally appealing non-invasive alternative plants can substitute for particular invasive plants. Second, close contact with consumers and high public visibility of the horticulture trade also increase the potential for self-regulation within this industry, as these characteristics can increase business benefits associated with cultivating an environmentally responsible business image. Finally, the credible threat of increased government regulation of horticultural imports presumably increases pressure on the horticulture trade to proactively adopt voluntary initiatives. Indeed, the industry increasingly prefers self-regulation as an important alternative to imposing higher-level rules and regulations. But there are incentives and obstacles to the adoption of voluntary initiatives. Incentives may include concern for the environment, consumer pressure, or avoidance of government regulations. Obstacles to adoption may include perceived economic or time constraints, or the lack of tools and infrastructure to implement voluntary measures (Burt *et al.*, 2007).

The incentives for industry to participate in voluntary approaches are often focused on good public relations and 'environmentally friendly' branding as a contribution to enhanced corporate social responsibility. The effectiveness of voluntary Codes is difficult to evaluate with precision: without an underpinning regulatory framework, there are identified risks of "free-riding"⁹ and regulatory capture. A 2009 workshop comparing national experiences and lessons learnt in developing voluntary Codes¹⁰ found that to be fully effective, they should be combined with information campaigns and be widely disseminated to avoid the 'best-kept secret' phenomenon. This may increase the cost but also the likelihood of measurable long-term behaviour change (Shine *et al.*, 2010).

Burt *et al.* (2007), claim that laws specifically addressing the introduction and exchange of potentially invasive plants via the horticultural trade remain inadequate. However, in some cases, regulation is preferred than self-regulation in order to avoid the problem of "free riders". The effectiveness of voluntary Codes also needs to be proven, as pointed out by Dehnen-Schumutz *et al.* (2008). The voluntary nature of these codes of conducts makes them largely dependent on the effort with which they are promoted and utilized in the gardening public and the horticultural industry. Such schemes have no specific targets or time frame nor the option for decision makers to introduce a regulatory approach if compliance with the codes is low with many hoping to free ride on the efforts of a few nurseries. A further incentive for non-compliance is that customers' demand for particular invading species may be diverted from nurseries no longer selling species allowed by the voluntary scheme to nurseries not following the code and still offering the plants. A further major obstacle to these codes' success is the lack of publicly accessible information about invasive and potentially invasive ornamentals to which the rules of the code could be applied (Dehnen-Schumutz *et al.*, 2008). Indeed, coverage, publicity and information-oriented provisions feature among the criteria needed for a successful voluntary scheme (OECD, 2003). A voluntary CoC will be effective under the condition that a high number of horticulture professionals have adopted the instrument. High involvement rates will in turn depend on a good communication campaign and strategy.

⁹ Free riders are horticulture professionals who do not adopt the code. One of the main critics of voluntary schemes is indeed the principle that restriction will not be applied to the whole industry, but only to those who endorse the scheme.

¹⁰ http://archives.eppo.org/MEETINGS/2009_conferences/conf_codeofconduct.htm.

It is also crucial to define if the ban included in regulation or self-regulation instruments is defined at the species level only or if restriction of use is extended to cultivars, varieties and hybrids derived from plant species. Tallent-Halsell *et al.* (2009) reported the case of *Buddleja davidii* which is currently listed as a noxious weed by the Oregon Department of Agriculture (USA). In Oregon, the species is on the invasive species prohibited plant list. However efforts to curtail the spread of *B. davidii* in Oregon prove ineffective because only the species *B. davidii* was elevated to the noxious weed quarantine list in 2004. None of the cultivars were included on the list. All *B. davidii* sold in Oregon were of named cultivated varieties, such as "Black Knight" and "White Profusion," and thus, were exempt from regulation (Ream, 2006, quoted by Tallent-Halsell *et al.*, 2009). The prohibition failed to reduce introduction risks of *B. davidii* because no cultivars were mentioned in the regulation. The case of *B. davidii* could be generalized to other invasive plants used as ornamentals. Varieties, cultivars and hybrids represent a substantial part of the horticultural trade volume. In Britain, the latest edition of the Royal Horticultural Society's *Plant Finder* (Royal Horticultural Society 2006) lists more than 70,000 plants and cultivars available, up to half of the plants believed to be species, the other half cultivars (Dehnen-Schmutz *et al.*, 2008).

Advantages and drawbacks: a comparative approach

Numerous publications deal with the argumentation for and against the use of voluntary approaches¹¹. Heywood *et al.* (2013) summarized advantages and drawbacks of voluntary codes of conduct on IAP (table 1). In table 2, a comparative table between voluntary and mandatory instruments on IAP is presented. The comparison is based on the feedback from the experience in Belgium where both self-regulation and regulation instruments on IAP exist.

Table 1: Advantages and drawbacks of voluntary codes (source: Heywood *et al.*, 2013)

Advantages
<ul style="list-style-type: none"> - They play a key role in building awareness, encouraging best practice, changing attitudes and encouraging voluntary compliance; - Being voluntary, they are easier to develop, modify and disseminate than legally binding instruments and they can be more readily adjusted to meet changing circumstances; - If successfully implemented on a widespread basis, they may moderate the need for regulatory alternatives.
Drawbacks
<ul style="list-style-type: none"> - Codes of conduct or guidelines have no specific targets or time-frame and their effectiveness depends largely on how well they are promoted; - Experience of the effectiveness of voluntary codes is mixed; - Ensuring compliance would need to be carefully monitored, thus requiring some supervisory arrangements; - Difficulties of getting the message to some of the key stakeholders.

Table 2: Comparative table between voluntary and mandatory instruments

Voluntary instrument (i.e. self-regulation)	
Advantages	Drawbacks
Flexible – easy to revise Quick to implement Applied at the national or regional level Better support and acceptance from the sector Awareness-raising effect	Not obligatory (i.e. problem of "free-riders") Not legally binding (no penalty if disregarded) Limited environmental impact* Promotion/communication campaign needed Control/monitoring needed
Mandatory instrument (i.e. regulation)	
Advantages	Drawbacks
Obligatory and equal ground for all (no "free-riders") Legally binding No consultation needed Higher environmental impact**	Slow to implement (i.e. legislative procedure) Less flexible – more difficult to revise Limited geographical level (regional, federal) Limited support from the sector*** Communication and control needed (i.e. inspections) Limited awareness-raising effect

*: depending on (1) the type of voluntary approach; (2) the species targeted by restriction of use and (3) the effectiveness of the communication campaigns and monitoring.

***: depending on the communication and control related to the law.

***: depending on the species targeted by the ban.

¹¹ See Ten Brink (2002).

EXAMPLES OF VOLUNTARY APPROACHES ON INVASIVE ALIEN PLANTS

The impact of self-regulation tools on IAP can be compared through several criteria such as the categories of stakeholders reached, the number of measures proposed, the number of species targeted by restriction of use, the number of stakeholders involved, the implementation of a communication campaign, etc. As stated in the introduction, various forms of Codes are mentioned around the world. In table 3, different voluntary approaches found in the literature are compared. These instruments are briefly presented below. Other national initiatives on Codes of conduct are described in the EPPO reporting service n° 6 and 7 (2011).

In **Belgium**, a voluntary Code of conduct was developed within the frame of the AlterIAS LIFE+ project (www.alterias.be). The Code was elaborated in consultation with the horticultural sector, scientists and administrations. The Code was approved after 9 months of negotiation. Five good practices are proposed: (1) keep informed about the list of invasive plants in Belgium; (2) stop planting and/or selling some invasive plants in Belgium; (3) disseminate information on invasive plants to customers or citizens; (4) promote the use of non-invasive alternative plants and (5) take part in early detection of new invaders.. The key measure of the Belgian Code is the limitation of use of 28 IAP (incl. all varieties, hybrids and cultivars derived from those species) which are banned from sale or planting by stakeholders involved in the scheme. The Belgian Code is a mixed form between a public voluntary scheme and a negotiated agreement. It was initiated by public authorities (regional and federal administrations)¹², but negotiated bilaterally between the horticultural sector and administrations. The instrument is based on a multi-stakeholders approach in order to cover the whole horticulture supply chain (i.e. from growers to users). It is addressed to horticulture professionals (e.g. nursery men, garden contractors, landscape architects, public green managers, etc.), gardeners and organizations (e.g. horticultural federations, environmental associations). The Code targets both terrestrial and aquatic invasive alien plants through species-specific recommendations. The instrument is under application at the national level.

A specific communication campaign (entitled 'Plant different') was planned in order to promote the Code and seek participation throughout the country. The charter can be signed 'manually' (paper version) or electronically (online registration). Stakeholders involved are registered in a partner database coupled with a google map system so that each partner was clearly identified and localized. The Code was launched in September 2011. On February 2014, 1027 stakeholders had adopted the Code throughout the country. Stakeholders included 496 horticulture professionals (incl. all categories of horticulture professionals), 478 gardeners and 53 organizations. Involvement rates were estimated between 10% to 30% for horticulture professionals (i.e. nursery men, garden contractors and landscape architects), 25% to 35% for municipalities, 90% for provinces and 21% for botanical gardens. A monitoring was implemented to assess (1) the changes of attitudes of horticulture professionals and gardeners and (2) the perception of the Code by horticulture professionals. In 2013, 56% of nursery professionals, 73% of public green managers working in municipalities and 69% of private managers (landscape architects, garden contractors) had heard of the Belgian Code (Halford *et al.*, 2013).

In **Great Britain**, DEFRA (Department for Environment Food and Rural Affairs) developed an Horticultural Code of practice for England and Wales, and another one for Scotland. The Code of practice was elaborated in consultation with representatives of government (DEFRA, the Scottish Executive, the Welsh Assembly Government), NGO's (e.g. Plantlife) and horticultural organizations (Gardening Which?, the Garden Centers Association, the Horticultural Trades Association, the Royal Horticultural Society, the National Trust, the Ornamental and Aquatic Trades Association and the Royal Botanic Gardens of Kew). The first version was published in 2005 and revised in 2011 following the recommendations from the CoE/EPPO Code of conduct on horticulture and invasive alien plants. A similar Code of practice was launched in Ireland in 2008 and revised in 2012. The British Code of practice provides '*advice and guidance on the safe use, control and disposal of invasive non-native*

¹² The AlterIAS project was co-financed by regional and federal administration responsible for environment in Belgium (Agentschap voor Natuur en Bos, Bruxelles Environnement – Leefmilieu Brussel, Federal Public Service, Service Public de Wallonie).

plants for everyone engaged in horticulture and related activities that involve the use of plants' (DEFRA, 2011). Nine guidelines are recommended such as 'dispose of plant waste responsibly', 'know what you are growing and buying', 'know what you are supplying or selling', 'know what you are specifying', 'follow control advice', 'watch out for hitchhikers on plant and soils', etc. No list of species is annexed to the Code which targets the approximately 50 plant species that are listed in Schedule 9 of the Wildlife and Countryside Act, 1981. There is no explicit restriction of use measure and no subscription procedure (i.e. a signature process). The Code is aimed at everyone engaged in horticulture, gardening and related activities that involve the use of plants. The number of stakeholders involved remains unknown. A survey showed that less than 50% of horticulture retailer was aware of the Horticultural Code of Practice (Creative research, 2009).

In addition to the British Code of Practice, the 'Be Plant Wise' campaign was launched by DEFRA and the Scottish Government to raise awareness among gardeners, pond owners and retailers of the damage caused by invasive aquatic plants and to encourage the public to dispose of these plants correctly (www.nonnativespecies.org/beplantwise). The program started in February 2010 (Booy, pers. comm., 2012). The campaign is focused on three key messages: (1) 'Know what you grow'; (2) 'Stop the spread' and (3) 'Compost with care'. The campaign met some success in terms of involvement and media coverage. The Horticultural Trade Association, Ornamental Aquatic Trade Association, Royal Horticultural Society, and wild plant conservation charity Plantlife are all supporting the campaign.

In **France**, several initiatives were implemented at local scales. In 2007, a 'charte d'engagement' was developed in Picardie (north of France) by the Conservatoire Botanique National de Bailleul. This charter was addressed to nursery professionals. The charter includes measures like specific labeling, restriction of use of 12 species and dissemination of information panels or posters. No data are available concerning the results from this initiative (Toussaint, pers. comm., 2013). In 2007, another 'charte d'engagement' was developed within the frame of a LIFE Nature project (inspired from the charter produced by the CBNBI). This Code was limited to the area covered by the project (the Grand site Gâvres – Quiberon). No information is available about the effectiveness of this instrument (i.e. the number of stakeholders involved). The impact seems limited, with few nursery professionals having adopted the Code (Bedouet, pers. comm., 2013).

In **Germany**, an agreement (entitled "Vereinbarung zum Umgang mit invasiven Arten") was developed in 2008 to deal with invasive alien plants. The agreement includes general guidelines and two measures (i.e. be aware/informed about the risks of invasive plants, deliver appropriate recommendations on plantings). The recommendations are addressed to the horticultural and gardening sector. The document refers to the list of 40 invasive plants included in the Neoflora system (www.neophyten.de). Detailed recommendations are specified in a handbook with factsheets on invasive plants. The document is signed by the Central Horticultural Association and the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. No information is available about the effectiveness or the changes of attitudes resulting from this instrument (Uwe Starfinger, pers. comm., 2012).

In **The Netherlands**, a sectorial agreement (negotiated agreement) on invasive aquatic plant was signed in February 2010 (the 'Covenant Waterplanten'). The agreement was concluded after three years of negotiations. The contract is signed by the government represented by a public authority (the Minister of Agriculture, Nature and Food safety) and an association of regional water authorities (the 'Unie van Waterschappen'). The partners of the horticulture industry are (1) trade associations (e.g. the 'Nederlandse Bond van Boomkwekers', the 'Vereniging Landelijke Organisatie Dibevo' and 'Tuinbranche Nederland') and 10-15 plant nursery firms covering 95% of the trade volume. The agreement includes two measures: (1) stop the sale and distribution of six invasive aquatic plants; (2) adopt specific labeling for seven aquatic plants.

A communication campaign (entitled 'Geen exoot in de sloot') was part of the implementation of the Dutch Code of conduct. Several documents were produced and disseminated. The Dutch Plant Protection Service is responsible to closely monitor (1) the compliance with the Code of conduct and (2) the effects of the communication campaign. A control-inspection operation was conducted by

authorized officers in order to check if the nurseries involved in the agreement respected the commitment. The control was part of the agreement. Controls were realized by officers of the Food and Consumer Product Safety Authority (NVWA). A large majority of plant nurseries have actually respected the commitment (Van Valkenburg and Verbrugge, pers. comm., 2013). Quantified data were collected by Verbrugge *et al.* (2013). It demonstrates that voluntary instruments can efficiently contribute to reduce the sales of invasive plants at large scales (i.e. at a national scale). However we cannot generalize the results obtained with Dutch experience. Different results could have been reached with Codes that stakeholders can sign knowing that it will not be checked.

In **the United States**, the Saint-Louis Codes of conduct were one of the first self-regulation tools on invasive plants implemented in the world (with the GPUTS program in Australia, see below). Initially drafted in 2001 during a workshop held at the Missouri Botanical Garden – “Linking Ecology and Horticulture to Prevent Plant Invasions”, it was ratified in 2002 during a second meeting in Chicago. The Saint-Louis declaration is declined in several Codes (one Code for nursery professionals, one for landscape architects, one for gardeners), with different guidelines adapted to the target audience. For instance, the Code for nursery professionals include six recommendations such as ‘Ensure that invasive potential is assessed prior to introducing and marketing plant species’; ‘Work with regional experts and stakeholders to determine which species in your region are either currently invasive or will become invasive’; ‘Develop and promote alternative plant material’; ‘Where agreement has been reached among nursery associations, government, academia and ecology and conservation organizations, phase-out existing stocks of those specific invasive species in regions where they are considered to be a threat’; ‘Follow all laws on importation and quarantine of plant materials across political boundaries’ and ‘Encourage customers to use, and garden writers to promote, non-invasive plants’. No list of species is annexed to the Code.

At present, around 50 stakeholders are involved in the Saint-Louis Code, including nursery and landscape associations, botanical gardens, pest plant councils and garden clubs¹³. The potential efficiency of this Code is discussed by Burt *et al.* (2007). Nursery professionals were highly aware of invasive plants and accept responsibility as a trade for horticultural introductions, but only 7% of nursery professionals had heard of the St Louis Code three years after its implantation. This underlines the need for communication campaigns in order to efficiently promote voluntary approaches. In 2005, the Plant Right program (www.plantright.org) was founded in California to address the ongoing sale of invasive garden plants in an environmentally sound and economically viable manner. The program is promoting good practices and alternative plants. Plant Right invites California garden centers to be leaders in preventing the spread of ornamental invasive plants, and become experts at promoting non-invasive, regionally appropriate alternatives. Plant Right is guided by a steering committee called California Horticultural Invasives Prevention which is defined as a voluntary program.

In **Australia**, a draft strategy for invasive garden plants was developed by the Australian government and the Nursery Industry Association of Australia within the frame of a program entitled “*Garden Plants Under the Spotlight (GPUTS): an Australian strategy for invasive garden plants*”. The GPUTS draft was developed from a meeting held in Adelaide on 5-7 August 1998, and the draft was produced in 1999 (Roush *et al.*, 1999, quoted by Moss *et al.*, 2005). The strategy proposed a national approach for addressing the weed problems that occur in agriculture and natural ecosystems caused by plants that have escaped from gardens and other landscaped areas. The strategy outlined approaches that could be adopted by local, state, territory and federal government agencies, as well as by the plant industry and horticultural media. Education programs were recommended as the first step to be undertaken by all parties. The strategy emphasised replacing plants of concern as weeds with non-weedy alternatives, and the importance of increasing general awareness nationally that plants that are not a weed problem in one state, territory or region could be a weed problem elsewhere (Moss *et al.*, 2005).

Although the result of comprehensive consultation with the horticultural industry, this initiative did not apparently move forward and its attempt to voluntarily remove from sale 52 species of garden plant

¹³ <http://www.centerforplantconservation.org/invasives/CodesN.asp>

failed, largely because nursery associations in some individual states did not embrace the initiative (Moss *et al.*, 2005, quoted by Heywood *et al.*, 2011), although it was supported by the national body who participated actively in its formulation. However, there is at least one successful local voluntary system of removal from sale of known invasive species in Canberra, but only over a period of 10 years and after an impressive degree of persistence (Butler 2004, quoted by Groves *et al.*, 2005). Despite the failure of the GPUTS program, another program was developed in Australia (Grow Me Instead). However the program is mainly focused on alternative plants. The Grow Me Instead program is an initiative of the Nursery and Garden Industry Australia promoting a positive change in the attitude of both industry and consumers toward invasive plants (www.growmeinstead.com.au). The purpose of the program is to identify common garden plants that have now become environmental weeds in your local area, and to suggest alternative plants.

Table 3: Comparative table of self-regulation tools on invasive plants under application in Europe and abroad.

Country	Date	Type	Target audience	Nb of measures	Species specific*	Nb of species targeted by restriction of use	Signature process	Nb of stakeholders involved
England and Wales ¹⁴	2011	Code of practice	Horticulture professionals** and gardeners	9	No	No list	No	No data
Ireland ¹⁵	2012	Code of practice	Horticulture professionals	8	No	No list	No	No data
France ¹⁶	2007	Charter (LIFE)	Nursery professionals***	2	Yes	5 species	Yes	No data
France	2007	Charter (CBNBI)	Nursery professionals	2	Yes	12 species	Yes	No data
Germany ¹⁷	2008	Code of conduct	Horticulture professionals and gardeners	2	No	No list	Yes	1
The Netherlands ¹⁸	2010	Negotiated agreement	Aquatic plant nurseries	2	Yes	6 species	Yes	15-20
United States ¹⁹	2002	Code of conduct	Nursery professionals, landscape architects, gardeners, botanic gardens and government	6 - 11	No	No list	Yes	~ 50
Belgium ²⁰	2011	Code of conduct	Horticulture professionals, botanic gardens, gardeners and organizations	5	Yes	28 species	Yes	1027

* : The instrument is considered as "species-specific" when one of several measures refers to a list of invasive plants directly annexed in the Code.

** : Horticulture professionals include every professionals involved in activities related to horticulture (i.e. nursery professionals, landscape architects, garden contractors, public green managers, etc.)

*** : Nursery professionals include nursery men (producers, sellers, retailers, wholesalers, etc.) and managers of garden centers.

¹⁴ <https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?pageid=299>

¹⁵ <http://invasivespeciesireland.com/cops/horticulture/>

¹⁶ http://www.site-gavres-quiberon.fr/pages/life-nature/actions-theme.php?th_id=52

¹⁷ http://www.bmu.de/files/pdfs/allgemein/application/pdf/invasive_arten_vereinbarung.pdf and <http://www.q-net.de/download/Empfehlung-Invasive-Arten.pdf>

¹⁸ <http://www.vwa.nl/onderwerpen/werkwijze-plant/dossier/invasieve-waterplanten/convenant-waterplanten>

¹⁹ <http://www.centerforplantconservation.org/invasives/CodesN.asp>

²⁰ <http://www.alterias.be>

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