



LIFE + Information & Communication

AlterIAS Project

ALTERnatives to Invasive **Alien Species**

How to implement a voluntary Code of conduct on invasive alien plants in consultation with the horticultural sector

Lessons learned from the AlterIAS LIFE+ project [2010 – 2013]

Discussion paper

- March 2014 -

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This discussion note was developed within the framework of the AlterIAS LIFE+ project. The note aims at providing guidance to stakeholders from European member states willing to implement a voluntary instrument on invasive alien plants (IAP). The note describes the methodology used in Belgium to develop a Code of Conduct (CoC) on IAP in consultation with the horticultural sector. The modus operandi is based on the feedback from the AlterIAS project. Concrete recommendations will be provided, with a focus on measures which worked or did work with the horticulture industry, problems encountered and solutions proposed. Inputs from other experiences on CoC will be included in order to provide a more exhaustive and critical review¹. To conclude, additional recommendations will be proposed to improve the effectiveness of CoC on IAP in the future.

Some parts of this note are included in a paper published in the EPPO Bulletin: Halford et al. (2014). The voluntary Code of conduct on invasive alien plants in Belgium: results and lessons learned from the AlterIAS LIFE+ project. EPPO Bulletin 44(2): 1-11. The reference of this article can be used for citation

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).

¹ Experiences with neighbouring countries were collected during the final conference of the AlterIAS project (Belgium, September 25th 2013) and the EPPO/CoE/UICN/DGAV/UC/ESAC workshop 'How to communicate with pests and invasive alien plants' (Portugal, October 08 – 10th 2013).

INTRODUCTION

Recognizing the increasingly serious problem of invasive alien species (IAS) in Europe, the LIFE program from the European Commission has financed numerous IAS-related projects. From 1992 to 2006, LIFE financed 187 IAS-related projects with a budget exceeding 44 million EUR (Scalera, 2010). Most of them were LIFE Nature and LIFE Environment projects (Scalera *et al.*, 2004). The LIFE program also promotes innovative approaches and methods which are transferable to member states. AlterIAS [ALTERnatives to Invasive Alien Species] was a LIFE+ 'Information & Communication' project entirely focused on awareness-raising on invasive alien plants (IAP) and prevention in the horticultural sector of Belgium (www.alterias.be). The project was launched in 2010 with a total budget of 10 108 04 € for a duration of four years. A voluntary Code of conduct (CoC) on invasive alien plants (IAP) was developed within the frame of this LIFE project.

The introduction and spread of IAP is considered as one of the most challenging ecological problems of the 21st century (Yi *et al.*, 2006). Ornamental horticulture is 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). In Belgium, many invasive plants initially introduced as ornamentals are still available on the horticulture market (Halford *et al.*, 2011; Vanderhoeven *et al.*, 2011). Plant invasions are facilitated through repeated introductions and cultivation that increase the likelihood of escape and establishment in natural habitats (Mack 2000, Kowarik 2003, Dehnen-Schmutz *et al.* 2008). When no information is delivered outside the scientific audience, recent surveys showed that horticulture professionals and gardeners (i.e. the general public) remain poorly informed about the risks of most IAP (Halford *et al.*, 2011; Vanderhoeven *et al.*, 2011). The lack of information and the continued commercial availability of many IAP highlighted the necessity to use preventive tools based on awareness-raising to reduce their introduction and spread. Education, information and awareness-raising campaigns are needed to influence future consumer behaviour and facilitating choices to reduce IAS risks (Shine *et al.*, 2011).

Prevention is recognized as much more effective than control actions on IAS because of a higher cost/benefit ratio from both an ecological and economical perspective (Vanderhoeven *et al.*, 2011). Preventive actions may include regulation or voluntary instruments (i.e. self-regulation). Voluntary approaches (VAs) have been recently used in the horticultural sector to deal with the introduction and spread of IAP. Such approaches can fulfill multiple roles: awareness-raising, stimulating stakeholder involvement, dissemination of best practices, supplementing existing regulations or filling a regulatory gap (Shine *et al.*, 2011). VAs are recommended in the European strategy on IAS which encourages the implementation of self-regulation tools in addition to regulatory instruments. Several Codes of conduct or Codes of practice on invasive alien plants are implemented throughout the world. The first voluntary approaches being the Garden Plants Under the Spotlights Strategy (GPUTS) developed in Australia in 1999 (Moss *et al.*, 2005) and the St. Louis Code of conduct for nursery professionals implemented in the United States in 2002 (Reichard, 2004). 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 (EPPO) and the Council of Europe (Heywood *et al.*, 2011). Following this publication, a survey conducted in 2011 by the EPPO reported 12 national initiatives on CoC on invasive alien plants (EPPO reporting service n°6 and 7, 2011). Despite a common goal, the content, scope and impact of these voluntary instruments may substantially differ: some instruments may have signatories; other Codes propose general guidelines or species-specific recommendations, which in turn may be negotiated (or not) 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. On top of this, the effectiveness of most self-regulation tools on IAP are poorly documented due to the lack of monitoring implemented once these instruments are applied. Relevant guidelines for implementing Codes are provided by Heywood *et al.* (2011). Complementary recommendations were also formulated during the EPPO/CoE workshop dedicated to Codes of conduct on horticulture and invasive alien plants (Norway, 2009)². Since 2009, the Belgian Code and other initiatives have been

² http://archives.eppo.org/MEETINGS/2009_conferences/conf_codeofconduct.htm.

implemented. Additional recommendations can be provided by drawing the lessons learned from these initiatives.

VOLUNTARY APPROACHES AND THE SPECIFIC FEATURES OF THE BELGIAN CODE

VAs cover a large variety of different arrangements, referring to a rich terminology including self-regulation, voluntary initiatives, voluntary codes (or Codes of conduct), environmental charters, voluntary accords, voluntary agreements, co-regulation, covenants, negotiated environmental agreements (Börkey *et al.*, 2000). According to Börkey *et al.*, voluntary approaches are defined as voluntary commitments of the industry in order to pursue actions leading to the improvement of the environment. Three main types of voluntary approaches are distinguished in the literature: (1) unilateral commitments; (2) public voluntary schemes and (3) negotiated agreements.

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.*, *op. cit.*). 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.

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)³, but negotiated bilaterally between the horticultural sector and administrations. It is a voluntary charter which recommends the adoption of good practices in order to (1) raise awareness among horticulture professionals and (2) reduce deliberate introductions of invasive plants in green areas, gardens and nurseries. As with other codes of conduct, it is a voluntary tool based on the principle of self-regulation (i.e. everyone is free to endorse it). The Belgian instrument is also 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, gardeners and organizations (e.g. horticultural federations, environmental associations). The horticulture professionals targeted are nursery men (producers, sellers-retailers, wholesalers) and garden center managers, garden contractors, landscape architects, public green managers in public departments (cities, municipalities, provinces), nursery managers in botanical gardens.

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

³ 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).

system (available on www.alterias.be) so that each partner is clearly identified and localized. The number of partners is unlimited. The Belgian Code is not legally-binding and based on a moral commitment (i.e. no penalties if disregarded). The content can be revised periodically in consultation with stakeholders. The instrument has been developed in a process including four distinct steps or phases: (1) the preparation; (2) the consultation; (3) the implementation/promotion and (4) the monitoring. Each phase is characterized by drivers and obstacles which will be described in next pages.

PHASE 1: THE PREPARATION OF THE CODE AND IMPORTANT PREREQUISITES

Risk assessment and listing of invasive alien plants

Before drafting a Code, it is strongly recommended to have a list of invasive plants based on a scientific assessment. Invasive alien plants must be first identified and listed, as recommended by EPPO/CoE⁴ and IUCN⁵. In Belgium, invasive alien species are classified in the *Harmonia* information system which has been developed at the initiative of scientists gathered within the Belgian Forum on Invasive Species (<http://ias.biodiversity.be>) in order to help policy makers and land managers in the identification of species of most concern for preventive or mitigation actions. This list system of non-native organisms is built using a standardized assessment protocol, ISEIA (Invasive Species Environmental Impact Assessment), which allows assessment and categorization of exotic species from any taxonomic group according to their invasion stage in Belgium and to their impact on native species and ecosystem functions (Branquart *et al.* 2010). The Belgian list system is based on three different list categories as recommended in the European strategy on Invasive Alien Species in 2003. Those categories are defined according to the severity of impacts on the environment: no negative impact (white list), negative impact suspected (watch or grey list) and negative impact confirmed (black list). The 'black list /watch list' system was in place long before the AlterIAS project starts. The Belgian CoC is based on the list of invasive plants available in *Harmonia*. This important prerequisite allowed preparing a Code with species-specific measures/recommendations (i.e. a Code which takes into account the environmental impacts of species).

The assessment in *Harmonia* is realized by different expert working groups from different research institutes and universities in Belgium. As the assessment precisely deals with environmental impacts of invasive species⁶, the 24 experts were chosen because of their scientific knowledge of the invasive species issue, species biological characteristics and distributions, and/or invasive environmental impacts. However during the consultation phase (see step 2) it has been criticized that nursery professionals were not included in the working groups responsible for the assessment of invasive plants. Nursery professionals could be consulted as experts having a good knowledge of plants, dispersal capacities and ornamental uses. It was also criticized that the ISEIA protocol only takes into account negative environmental impacts. The assessment could/should be based on costs/benefits taking into consideration both negative and positive impacts of plants. Such ambiguous endpoints for risk assessment have been recently underlined by Humair *et al.* (2013).

Examination of the horticultural sector

Another important prerequisite consisted of analyzing how the Belgian horticultural sector (and more specifically the ornamental subsector) was structured by identifying the main horticultural federations/associations active in the country. The ornamental sector is considered as a subsection of the horticultural sector which includes the production ornamental plants, fruits and vegetables. It is a complex subsector including various products derived from ornamental plant cultivations (e.g.

⁴ Recommendation n°1 from the EPPO/CoE workshop on Codes on conduct on horticulture and invasive alien plants (Norway, 2009): http://archives.eppo.org/MEETINGS/2009_conferences/conf_codeofconduct.htm.

⁵ Recommendation n°1 from the IUCN workshop on IAS and the urban dimension (Switzerland, 2013): https://cmsdata.iucn.org/downloads/conference_ias_the_urban_dimension_recommendations_1.pdf

⁶ The *Harmonia* system has been recently revised within the frame of the Alien Alert project. It has become Harmonia+ that now incorporates all stages of invasion and different types of impacts (e.g. environmental, human health, animal health, plant health).

ornamental trees and shrubs, annual and perennial plants, forest plants, fruit trees, etc.) and floriculture (e.g. azalea productions, interior plant productions, plant in pots, cut flowers, bulbs and

The ornamental sector in Belgium: an overview

The ornamental sector in Belgium is an economic activity of excellence. The Belgian sector is renowned for its versatility, tradition, craftsmanship and quality. For more than a decennium, tree cultivation is the most important subsector with international aura. After the Netherlands and Denmark, Belgium is the most important world exporter for ornamental plant products. Cultivation of ornamental plants is more developed in Flanders, with 95% of the national market (Anonyme, 2010). Subsequently, gardening is a widespread practice in Belgium. The proportion of households in possession of a garden is high (82%), ranking in second place in Europe just after Ireland. The household consumption in nursery plants is estimated to a total budget of 345 million euro per year (Anonyme, 2003).

Approximately 1800 nursery growers are located in Flanders (all categories considered) and more than 1000 nursery men are working full time in 550 firms of tree nurseries throughout Belgium (Anonyme, 2010). In Wallonia 400 producers of ornamentals are counted, with 100 producers working full time and the remaining working part time (Faux, 2012). A total of 2200 producers of ornamental plants (all categories considered) are therefore active in Wallonia and Flanders. The sector is much less developed in the Brussels-Capital region. The main federation in Wallonia is the 'Fédération Wallonne Horticole' (FWH), with around 1000 affiliated members of which 193 nursery men. The main federation in Flanders is the 'Algemeen Verbond van Belgische Siertelers en Groenvoorzieners' (AVBS), with 1400 affiliated members of which 299 nursery men. The Flemish ornamental plant cultivation has a production value of more than 500 million euro (Anonyme, 2010). In Wallonia, the horticultural production has an economic value of 160 million euro (Fallon, 2012). Ornamental horticulture contributes to 50% of the Walloon horticulture, i.e. 80 million euro (Faux, *op. cit.*). The total value of ornamental horticulture in Wallonia and Flanders is therefore estimated to 580 million euro.

Garden contractors are important users of ornamental plants. In Wallonia, the consumption in ornamental plants by garden contractors was estimated to 9 million euro per year (Anonyme, 2003). There are 7160 employees working in the sector of parks and gardens in the country, gathering 2232 workers in Wallonia, 4657 in Flanders and 271 in Brussels (Observatoire des secteurs verts, quoted by Fallon, 2012). In 2008, 6400 firms were counted in Belgium (Page d'Or, quoted by FWH-APHW, 2011). The main federation of garden contractors is the 'Belgische Federatie Groenvoorzieners - Fédération Belge Entrepreneurs Paysagistes' (BFG-FBEP; 800 – 850 members).

Public departments responsible for planting in cities and municipalities are other actors of the ornamental sector. Cities order plants directly to producers or wholesalers. In Wallonia the annual consumption in ornamentals by municipalities was estimated to one million euro per year (Anonyme, 2003). There are 308 municipalities in Flanders, 262 municipalities in Wallonia and 19 municipalities in Brussels. Municipalities are also gathered in organizations in Belgium: the 'Union des Villes et des Communes' (UVCW) in Wallonia, the 'Vereniging Voor Openbaar Groen' (VVOG) in Flanders and the 'Association Bruxelloise des Gestionnaires Publiques' (ABGP) in Brussels.

No detailed statistics are available concerning the total number of landscape architects who were registered by INS (Institut National Statistique) under the same code than interior architects and urbanist architects. In 2011, a total of 15152 firms related to landscape architecture activities were registered in the statistics provided by the Federal Public Service - Economy. This included 670 firms specialized in urbanism architecture, landscape and garden architecture, and 14182 firms working in Landscape management service. Landscape architects are gathered in the 'Association Belge des Architectes de Jardins et Paysagistes – Belgische Vereniging van Tuinarchitecten en Landschap architecten' (ABAJP-BVTL; 130 members).

tubers, etc.). The sector is characterized by various types of horticulture professionals. It includes nursery men (including sellers-retailers, producers-growers, wholesalers, etc.), managers of garden centers, florists, garden contractors, landscape architects, public green managers, managers of botanical gardens, etc. A CoC has more chance to be successful if the stakeholders targeted by the Code are well organized and structured into organizations. The presence of a large industry association appears to be a crucial factor in workability (Moss *et al.*, 2005). At the design phase, Dresselaers *et al.* (2012) have identified two success factors of voluntary agreements: (1) the sector concerned must be organized, homogenous and ideally composed of a limited number of firms covering a high proportion of the trade volume; (2) the political climate must be favorable for solving the environmental issue targeted by the agreement. In Belgium, public authorities (regional and federal administrations) were contacted before the project started in order to (1) prepare the ground and justify the need for a preventive strategy based on a voluntary approach (instead of a regulation) and (2) get the support from policy-makers.

Once main horticultural federations/associations are identified, preliminary contacts with representatives are needed in order to evaluate if the sector is willing to develop a CoC. The support from horticultural federations/associations is strongly advised. They will play a major role during the next steps of the process. During the consultation phase, they will give a credit to the content of the Code. Such a credit will be useful when promoting the Code to horticulture professionals. During the promotion phase, horticultural organizations will play a role as multipliers of information to affiliated members. In addition, the support from federations is a strong argument which facilitates the endorsement from nursery professionals.

Initial survey and baseline situation

Finally a preliminary survey is recommended to (1) quantify the presence and economic value of invasive alien plants within the horticultural market and (2) assess the perception of the invasive alien plants issue by horticultural professionals and gardeners. In Belgium an initial survey was carried out at the very beginning of the AlterIAS project (see frame). The survey was addressed to horticulture professionals and gardeners. This survey was useful for the monitoring/evaluation phase (phase 4). A similar survey was conducted at the end of the project in order to quantify the changes of attitudes.

Recommendations for the preparation phase

- Choose the most relevant type of voluntary instrument to implement in your country and consider voluntary approaches as complementary tools with regulation instruments. Codes of conduct and self-regulation should be considered as a first step that, if not successful, may lead to regulation⁷.
- List the alien plants considered to be invasive in your country/region. The listing must be based on scientific data and objective criteria (preliminary work of risk assessment). A CoC will gain in readability, understanding and effectiveness if the species targeted are clearly defined and scientifically assessed.
- Identify the main horticultural federations/associations which are active in your country and contact representatives of horticultural organizations in order to get their support/collaboration for developing a Code. Interact and seek for partnership with the different actors of the ornamental subsector: nursery men, managers of garden centers, garden contractors, landscape architects, public green managers working in cities and municipalities, managers of botanical gardens, etc.
- Perform an initial survey in order to (1) quantify the presence and economic value of invasive plants within the ornamental market; (2) assess the perception of the issue by horticulture professionals. Involve social scientists in the preparation of the survey and take into account the needs and values of the industry as well as the habits and expectations of consumers⁸.

⁷ Recommendation n°4 from the EPPO/CoE workshop on Codes on conduct on horticulture and invasive alien plants.

⁸ Recommendation n°9 from the EPPO/CoE workshop on Codes on conduct on horticulture and invasive alien plants.

The baseline situation: results from the socio-economic survey on invasive plants and ornamental horticulture

An initial survey was carried out at the very beginning of the AlterIAS project in order to (1) quantify the presence and economic value of invasive alien plants within the horticultural market in Belgium; (2) assess the public perception (i.e. level of knowledge, awareness and concern, need for information, solutions) of IAP by horticulture professionals and gardeners (Halford *et al.*, 2011). A total of 634 answers were collected and analysed to gain an overview of the baseline situation. The presence of IAP in the market was completed by an analysis of 146 horticultural catalogues.

Results showed that 67% of terrestrial invasive plants were still available in catalogues (figure 1). More species were identified when it was asked to nursery men which plants were sold in nurseries: 93% of terrestrial and aquatic invasive plants were available in nurseries. Invasive trees and shrubs such as *Robinia pseudoacacia*, *Amelanchier lamarckii*, *Quercus rubra*, *Acer negundo*, *Cornus sericea* and *Buddleja davidii* were among the most frequent IAP found in catalogues, which suggest that they are widely used for gardening and landscape planting. Even widespread and well-known invaders such as the Asian knotweeds (*Fallopia* spp.), the black cherry (*Prunus serotina*) and the giant hogweed (*Heracleum mantegazzianum*) were still present in catalogues. Nursery professionals identified 32 invasive alien plants used as ornamentals and considered of economic value. The top five of invasive species of economic value was *Prunus laurocerasus*, *Buddleja davidii*, *Amelanchier lamarckii*, *Robinia pseudoacacia* and *Rhododendron ponticum*. No national statistics on the production value are available at the species level.

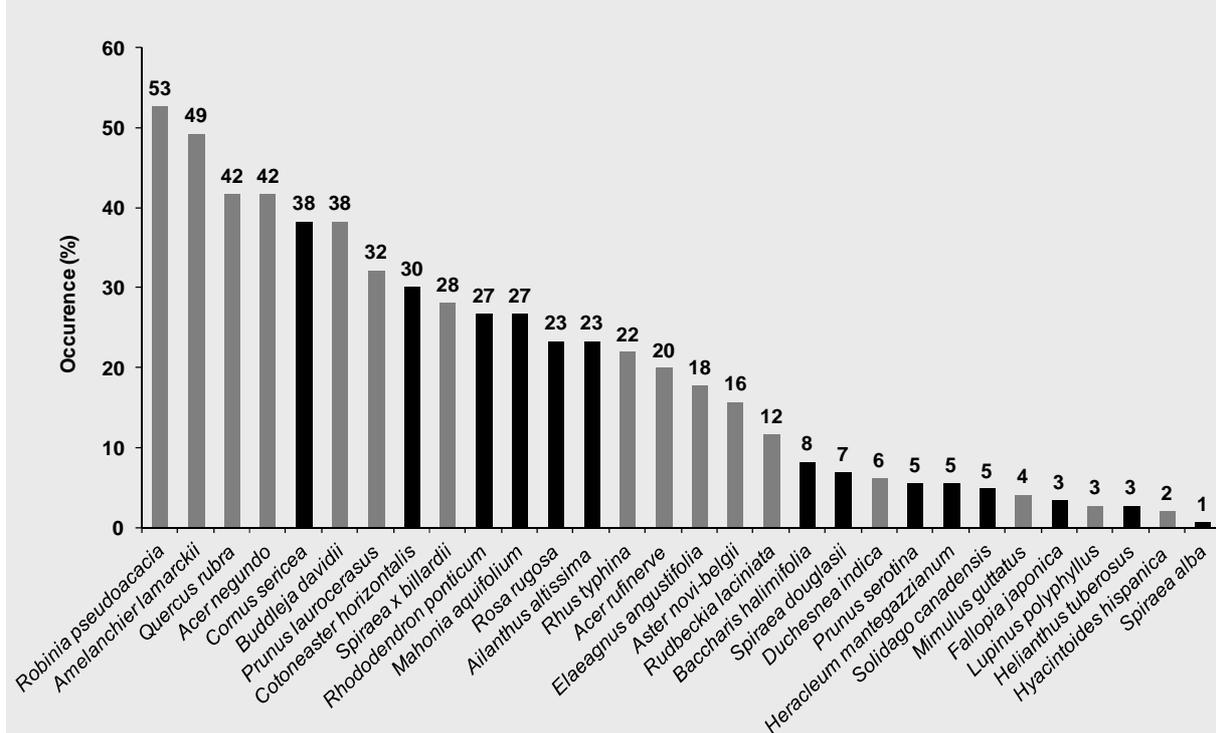


Figure 1: Occurrence of terrestrial IAP in horticultural catalogues in Belgium (n=146 horticultural catalogues) in 2010. Grey bars: watch list species; black bars: black list species.

Most horticulture professionals and gardeners had a correct level of knowledge of the concept of IAP (i.e. question related to the definition of IAP). However the need for information was high. Only 31% of respondents felt enough informed on the issue and 84% considered they should be better informed about IAP. Only 11% of respondents had heard of voluntary instruments such as Codes of conduct on IAP. Horticulture professionals expressed a strong willingness to participate in programs designed to prevent the spread of IAP: 61% of nursery men and 73% of private managers claimed that they would accept to endorse a voluntary Code.

PHASE 2: THE CONSULTATION WITH THE HORTICULTURAL SECTOR

The Belgian CoC implemented within the framework of the AlterIAS project was developed in consultation with the horticultural sector (i.e. horticulture professionals and representatives of horticultural federations/associations), administrative bodies responsible for environment (i.e. representatives of public authorities) and the scientific community (scientists specialized in invasion biology)⁹. Consultation processes can be powerful tools to resolve environmental problems, find a common ground and achieve a broad consensus with actors from different disciplines. They can be efficient communication method for collaborative problem solving.

A step by step process

The consultation was organized through round table discussions gathering a representative sample of horticulture professionals. Two working groups were consulted in Southern Belgium (i.e. Wallonia - French speaking region) and Northern Belgium (i.e. Flanders – Dutch speaking region). The working groups were composed of (1) ornamental plant producers and sellers (nurseries and garden centers) and (2) ornamental plant users (including public green managers, landscape architects, garden contractors and representatives of botanical gardens). Working groups were separated in order to facilitate an agreement between participants practicing similar activities. Ten meetings were organized from November 2010 until July 2011, gathering a total of 70 participants. Round table discussions were conducted at the initiative of the AlterIAS team to identify workable measures to reduce trade and use of IAP in Belgium and develop a CoC taking into account both the environmental impact and the economic value of IAP. The consultation with the horticulture sector was necessary to propose practical recommendations which were acceptable for the profession. The Belgian CoC was therefore the result of a trade-off taking into consideration the invasiveness of species (i.e. environmental impacts) and socio-economic factors related to ornamental uses.

Members of the AlterIAS team played the role of moderator during round tables. Human resources were available among the project partners. The moderator has an important role to guide the discussion and find a common ground. There was also a president of session (a chairman) in order solve eventual conflicts or difficult conversations. If no resources are available among the project partners, maybe the help from a professional and neutral moderator – facilitator could be required. However it is difficult to find a skilled facilitator having a good knowledge of IAP and Codes of conduct, in addition with good relationships with horticulture professionals. The consultation process was planned in five steps:

- Step 1: the first part of the meeting was dedicated to the presentation of the invasive plants issue (definition, impacts, link with ornamental horticulture, etc.), the ISEIA protocol and the list of invasive plants in Belgium, the AlterIAS project and the philosophy of voluntary Codes of conduct. The results of the initial survey were also presented. The second part of the meeting consisted in open discussions on preventive measures that could be included in a voluntary CoC in order to reduce introductions and spread of invasive plants in gardens, green areas and nurseries. It was important to guide the discussion so that measures were proposed by participants.
- Step 2: synthesis of all measures proposed by the two working groups during step 1; selection of common measures accepted by all participants; definition of the list of species to withdraw from sale and/or planting (negotiation species by species). The method was based on unanimous votes from participants (consensus method to build a 'consensus list').
- Step 3: submission of a first draft of Code defining the content of the commitment and integrating measures unanimously proposed during the consultation; discussion with horticultural federations/associations for revision/adaptation/adjustment.
- Step 4: definitive approbation of the Code through a final meeting gathering participants from the two regions; presentation of the final version; planning of an official ceremony of signature aiming at launching the Code and giving publicity in press.
- Step 5: official signature by horticultural federations/associations.

⁹ Scientists from the Belgian Forum on Invasive Species (BFIS).

The **consultation process** carried out in Belgium was **successful**: the Code was approved by horticultural organizations after 9 months of negotiation. Such a progressive process is in line with the process model referred by Ten Brink (2002) presenting a model in 6 steps for preparing VAs:

- Step 1: Specifying the environmental problem to be resolved;
- Step 2: Negotiate the agreement;
- Step 3: Are the negotiation successful;
- Step 4: Drafting an agreement proposal;
- Step 5: Reviewed the proposed agreement text;
- Step 6: Is the agreement acceptable to be signed.

The content of the Code is characterized by several articles specifying the target audience, the geographical scope of the instrument, the revision process, etc. The nature of the commitment consists of five good practices proposed by horticulture professionals (see below). The full version is available at www.alterias.be. The first version was drafted in September 2011. The Code was revised in December 2013 once the AlterIAS project was over. The measures proposed are in line with the recommendations provided by Heywood *et al.* (2011).

The good practices recommended in the Code of conduct on invasive plants in Belgium

During the consultation process, similar recommendations were proposed by participants from the two working groups. The Code is based on five good practices unanimously approved:

1. Keep informed about the list of invasive plants in Belgium
2. Stop planting and/or selling some invasive plants in Belgium (see the 'consensus list')
3. Disseminate information on invasive plants to customers or citizens¹⁰
4. Promote the use of non invasive alternative plants
5. Take part in early detection of new invaders

The horticultural sector considered these measures as realistic and easy to apply in a firm and/or in a public department. The Belgian Code can be implemented with no costs and very limited additional working load. Codes of Conduct should not include an excessive number of measures or recommendations. The monitoring of the Belgian Code (see phase 4) showed that three measures (out of five) were mostly cited by horticulture professionals who had signed the Code (Halford *et al.*, 2013). In the United States, 83% of nursery professionals reported having participated in at least one preventive measure included in the St. Louis voluntary Codes of conduct, with an average of 2.4 out of 7 (Burt *et al.*, 2007).

The 'consensus list' and the 'communication list'

The key measure of the Belgian Code is the limitation of use of IAP (i.e. ban from sale or planting). Negotiations enabled a list of 28 invasive alien plants (including all varieties, hybrids and cultivars derived from those species) to be defined to be withdrawn from sale and/or planting (recommendation n° 2 in the Belgian Code). This list was unanimously approved by vote from horticulture professionals gathered in working groups. A consensus was therefore reached among participants. That is why this list was called the '**consensus list**' (annex I of the Code). The concept of building consensus list is now cited abroad, especially in France (Mandon-Dalger *et al.*, 2013). The consensus list of the Belgian Code represents 43.8% of the total number of invasive plants in Belgium (a total of 64 plant species are included in the *Harmonia* information system).

¹⁰ Communication materials were produced and provided by the AlterIAS project. A package with communication materials (folders, brochures, poster) was sent by post to each professional who endorsed the Code and were registered in the 'partner database'. Postal costs were supported by the project.

A ban on the production, sale and planting of all invasive plants used as ornamentals was impossible within the frame of a voluntary approach. Restriction was accepted for (1) widespread and highly invasive plant species (e.g. *Fallopia japonica*, *Heracleum mantegazzianum*, *Prunus serotina*) and (2) species of low or medium economic value (e.g. *Duchesnea indica*, *Bidens frondosa*, *Mimulus guttatus*). However, restriction of use was refused for species of high economic value (e.g. *Buddleja davidii*, *Amelanchier lamarckii*, *Robinia pseudoacacia*, *Prunus laurocerasus*) which were appreciated for gardening and landscape planting. Species (i.e. species from the *Harmonia* information system) that were invading only specific habitats (e.g. *Rosa rugosa* in coastal dunes or *Robinia pseudoacacia* on rocky slopes or dry grasslands) or species that had a limited or unknown environmental impact (i.e. 'watch list' species and/or species at the very beginning of the invasion process) were hardly perceived as detrimental by horticulture professionals.

Invasive alien plants excluded from the consensus list were therefore included in a second list called the '**communication list**' (annex II of the Code) which includes 29 species. There is no restriction of use concerning those species. Communication and recommendations on planting have been proposed in order to limit their use near habitats of high conservation value. The communication on annex II species was defined with a message coupled with a pictogram which could be used in horticultural catalogues. The message was defined with the sector. It was recommended to communicate on these species with the following message:

"Some forms of the plants (cultivars, varieties, hybrids) included in this list may become invasive in certain natural habitats or in specific conditions, including in parks and gardens. Use them carefully and avoid planting it near vulnerable habitats where they could spread. If needed, ask for advice to nursery professionals. Alternative plants can be proposed instead of these species".

Only species of the black list and the watch list from the *Harmonia* information system (i.e. 57 species) were negotiated during the consultation process. The alert list (i.e. species not yet naturalized in Belgium) was not discussed. In tables 1, 2 and 3, the consensus list and the communication list are characterized according to different criteria from the *Harmonia* information system (i.e. plant type, environmental impact and invasion stage).

Table 1: Number and percentage of consensus list species and communication list species according to the plant type defined in the *Harmonia* information system

	Terrestrial plant		Aquatic plant		Total	
	Nb	%	Nb	%	Nb	%
Consensus list	20	44.4	8	66.7	28	49.1
Communication list	25	55.6	4	33.3	29	50.9
Total	45	100	12	100	57	100

Table 2: Number and percentage of consensus list species and communication list species according to the environmental impact defined in the *Harmonia* information system

	High impact (black list)		Moderate impact (watch list)		Total	
	Nb	%	Nb	%	Nb	%
Consensus list	18	60.0	10	37.0	28	49.1
Communication list	12	40.0	17	63.0	29	50.9
Total	30	100	27	100	57	100

Table 3: Number and percentage of consensus list species and communication list species according to the invasion stage defined in the *Harmonia* information system

	Widespread		Restricted area		Isolated populations		Total	
	Nb	%	Nb	%	Nb	%	Nb	%
Consensus list	10	50.0	11	47.8	7	50.0	28	49.1
Communication list	10	50.0	12	52.2	7	50.0	29	50.9
Total	20	100	23	100	14	100	57	100

Among the 57 invasive species discussed, the consensus list represents 44% of terrestrial plants and 67% aquatic plants. The consensus list includes 60% of the black list and 37% of the watch list. Finally, the consensus list includes 50% of widespread invasive alien plants, 48% of invasive alien in restricted area and 50% of invasive plants distributed in isolated populations. In table 4, the

consensus list and the communication list are characterized according to the economic value. Species were assigned to three classes of economic importance based on the answers collected from the initial survey (Halford *et al.*, 2011): high economic value (IAP considered as economically important by more than 5% of nurserymen), moderate economic value (IAP considered as economically important by 1-5% of nurserymen) and low economic value (IAP that were not considered as economically important by nursery men).

Table 4: Number and percentage of consensus list species and communication list species according to the economic value assessed from the initial survey (Halford *et al.*, 2011)

	High		Medium		Low		Total	
	Nb	%	Nb	%	Nb	%	Nb	%
Consensus list	0	0.0	12	70.6	16	69.6	28	49.1
Communication list	17	100.0	5	29.4	7	30.4	29	50.9
Total	17	100	17	100	23	100	57	100

No species of high economic value are included in the consensus list, which is characterized by 71% of invasive alien plants with a medium economic value and 70% of species with a low economic value. It should be noted that most species with a high economic value only have a moderate environmental impact in Belgium.

The need for an attitude of dialogue opened to debates

Steps 1 and 2 of the consultation were laborious and challenging due to (1) the difficulty of mobilizing horticulture professionals during round tables and (2) the different public perception of the IAS issue. Invasive alien plants remain a controversial issue within the ornamental sector. Discussions between scientists and horticulture professionals were sometimes difficult. Indeed, there is conflict in value between those who enjoy the benefits of exotic plants and those who are concerned about the harm such plants may cause (Reichard *et al.*, 2004).

During the consultation, discussions about the annex I and II of the Code were the most debated. Objections were frequently addressed about controversial issues such as the classification of invasive species in a black list/watch list system (concept not always positively perceived or easily understood outside a scientific audience); the invasiveness of species and cultivars¹¹; the feeling that scientists or ecologists have exaggerated/generalized the problem from a few widespread species; native or exotic alternative plants; 'native expanding plants' often considered as weeds (*sensu* Richardson *et al.*, 2000)¹² and as 'real' invasive plants in nurseries; the lack of self-regulation tools on IAP in neighbouring countries which export/import plants to/from Belgium, etc. The invasiveness of some species highly appreciated as ornamentals and classified as invasive by scientists was sometimes refuted. In England a similar mismatch was observed between the species that DEFRA (Department for Environment Food and Rural Affairs) considered to be invasive and the view of the trade. In many cases, a majority of the trade did not consider the plants in question to be potentially invasive (Creative research, 2009). In Belgium, some nursery men strongly disagreed with the point of view of scientists when they learnt that ornamental plants traditionally cultivated (for examples species of the genus *Rhododendron*, *Aster*, *Rosa*, *Cotoneaster*) were listed as invasive by scientists while those species were not invasive in some regions where they are cultivated. Horticulture professionals urged invasion ecologists to better consider local climatic contexts and regional conditions.

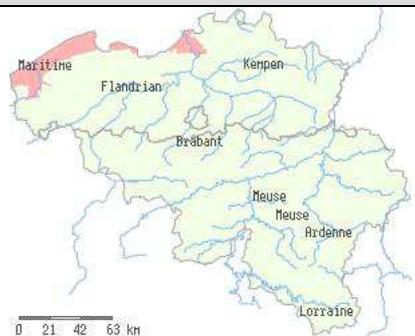
¹¹ The invasiveness of cultivars was largely debated during round tables. There is obviously a lack of scientific information about the invasive potential of horticultural types (i.e. varieties, cultivars and hybrids) derived from species listed as invasive in risk assessment systems. Indeed invasive plants are assessed at the species level. Limited data on invasiveness are available at the intra-specific level (i.e. sub-species level) or at the inter-specific level. However a growing literature is dedicated to the issue. A brief review was provided by Halford (unpublished data, available at <http://www.alterias.be/fr/que-pouvons-nous-faire/les-codes-de-conduite-sur-les-plantes-invasives/pour-les-professionnels-de-lhorticulture/information-complementaires>).

This question is of major concern for the horticulture sector. Most plants sold in the market are cultivars, varieties or hybrids. Some horticultural types maybe less invasive than others (i.e. sterile cultivars, dwarf cultivars, cultivars with reduced fertility) and should not be targeted by restriction of use measures. In the Belgian Code, it has been agreed that the ban from sale or planting applied to the consensus list species had to be extended to all cultivars and varieties derived from those species.

¹² According to Richardson *et al.* (2000) weeds are plants (not necessarily *alien*) that grow in sites where they are not wanted and which usually have detectable economic or environmental effects (synonyms: plant pests, harmful species; problem plants).

When such oppositions emerge, it is recommended to listen to the different points of view, try to understand the opinions expressed and the underlying reasons of block in order to find a common ground for a solution by starting with statements on which everybody agree. The point of view of the ornamental sector must be heard and understood. One frequently made mistake in communication consists in trying to convince stakeholders rather than listening and taking on board their points of view, understanding their motivations and how they relate to the issue (Hesselink *et al.*, 2007). It must also be understood that restriction of use will be accepted for certain invasive species only. It will be more difficult to withdraw species of high economic value on a voluntary basis. Indeed, a basic principle of any voluntary scheme states that the firms involved must perceive some gain or benefit (or at least no net loss) from participation (Alberini *et al.*, 2002). For species of economic value, no restrictions were therefore proposed in the Belgian Code, but only recommendations on planting based on local conditions where vulnerable habitats are located (see table 5).

Table 5: Examples of recommendation on planting proposed for annex II species (source: <http://ias.biodiversity.be>)

Invasive plant	Vulnerable habitats	Area concerned in Belgium
Rugose rose (<i>Rosa rugosa</i>)	Coastal dunes Sandy grasslands	
Oregon grape (<i>Mahonia aquifolium</i>)	Dry grasslands Chalk grasslands Thermophilous scrubs Rocky slopes Coastal dunes Limestone beech forests	

What about specific labelling?

Another preventive measure that is often cited in codes of conduct on IAP is the adoption of labelling practices. Two options are possible: unique logo or text labelling. Text labelling can be unique or species-specific (i.e. with information on invasiveness peculiarities, ability to escape, ecosystems at risk, etc.). Species-specific messages are more complicated to implement compared to a general or unique message, but it can work if the information is concise and relevant. As advised by Humair (2013), the content and layout should be tested in order to ensure it will be read and understood by customers. The labelling must be first accepted by nursery professionals who will be responsible of the implementation.

In Belgium, text labelling was considered as poorly applicable by the working group participants. The implementation of specific labelling was considered as costly, anti-commercial, time consuming and detrimental to the green image of the sector. No budget was planned in the AlterIAS project for designing and printing specific labelling. Horticulture professionals refused to design and implement the labelling with their own budget and resources. Theoretically, it was an attractive recommendation but in practice it appeared to be difficult to implement without budget or materials to provide to nursery professionals. However we cannot generalize with this experience in Belgium. Specific labelling can work in some cases. In the Netherlands, positive results were observed in the negotiated

agreement on aquatic invasive plants. A unique logo (with drawings illustrating the recommendations of use) was designed by a firm specialized in communication. Nursery professionals who signed the agreement have implemented this label with their own means. There was no financial support for implementing this measure. In Switzerland, another experience on specific labeling is on progress. This Swiss initiative is due to the implementation of a new regulation ('duty to inform') to limit the introduction of potentially invasive non-native plants. A text labeling was therefore designed under the supervision of a working group gathering scientists, administration representatives and representatives from the sector. A pilot study was conducted in order to test if the labelling was read and understood by customers (Humair, 2013). Preliminary results were positive. The final version is a yellow labelling. It will be implemented throughout the country. Results from this initiative are not yet available.

Alternative plants: native or non-native?

The use of non-invasive alternative plants (concept of 'green list') was considered as a positive solution which (1) counterbalances the restriction of use (by proposing substitute plants) and (2) has the potential to create a new market which could be profitable for the horticulture industry. In Belgium such a measure was easily accepted and positively perceived under the condition that horticulture professionals were free to propose alternative plants (i.e. native or exotic). Indeed there is a debate about the species that should be recommended as alternatives. If exotic species are proposed, the plants must present no risk of becoming invasive in the future. To limit those risks, most ecologists adopt a precautionary principle which is favorable with the idea of promoting native plants only. This point of view is not always shared by horticulture professionals. The feasibility of promoting native plants only depends on the country, the cultural and/or economical context. In some regions (e.g. South Africa, Reunion islands) native plants can be exclusively proposed. It is culturally accepted. This is probably due to the diversity of native plants available in these regions (compared to Western European countries where the diversity of native species used as ornamentals is rather poor). In other cases and/or countries, the exclusive promotion of native plants may provoke an opposition from the horticulture industry because most ornamental plants available in the market are exotic species useful for gardening or landscape planting. Most of them pose no problem for the environment (see the Williamson's tens rule stating that only one alien plant may become invasive out of 1000 species introduced)¹³. The same statement is observed in other programs dedicated to the promotion of non-invasive alternative plants (e.g. the Grow Me Instead program in Australia, the Plant Right program in California) In Belgium, the promotion of alternative plants would have failed if only native plants were exclusively recommended as alternatives in the CoC. Horticulture professionals involved in the Code were therefore free to choose and propose alternative plants to customers.

The selection of alternative plants must be realized in collaboration between scientists specialized in invasion ecology (and more specifically specialized in invasive alien plants) and horticulture professionals having the knowledge of ornamental plants and horticultural uses. If exotic ornamental plants are proposed as alternatives, a risk assessment should be undertaken in order to ensure that the plant presents no risks of escaping and becoming invasive. Hulme *et al.* (2008) suggest that importers offering these species for sale should be responsible for screening species for potential risk, excluding high-risk species from the market, establishing codes of conduct among suppliers and informing buyers of the potential environmental risks. However, Pest Risk Assessment (PRA) procedures require a wide range of diverse information including potential economic and social impacts of species or habitat availability (Dehnen-Schmutz, 2011). Providing a relevant PRA is therefore not always a realistic option considering the huge amount of data to collect. Even if data are available to screen alien species with objective criteria for non-invasiveness, few of them appear to be 'environmentally safe'. From a random sample of 534 non-native plants, Dehnen-Schmutz (2011) showed that only 13 species were found to be good candidates for alternatives (i.e. 2.4%).

A brochure on alternative plants was realized by the AlterIAS team, in collaboration with institutions specialized in horticulture. For practical reasons, native plants were proposed in this brochure. The project (1) had no time to realize PRA for exotic plants and (2) wanted to promote 'natural gardening'.

¹³ See Williamson M., Fitter A. (1996). The varying success of invaders. *Ecology* 77 (6):1661 – 1666.

Alternative plants were selected following three criteria: (1) non-invasiveness (i.e. the plant must present no risk of becoming invasive); (2) similarity in ornamental functions (i.e. the plant must have a similar horticultural use) and (3) availability in the horticulture market. The alternative plants presented in this brochure were therefore classified by ornamental function instead of presenting it face-to-face with invasive plants. The brochure was appreciated by gardeners, horticulture teachers and general public. It was massively distributed during horticultural events. However the brochure was more criticized by horticulture professionals who would have prefer to enlarge the selection to exotic plants. The publication of a brochure on alternative plants represents an important working load requiring a long time period for collecting data and consulting specialists in horticulture.

Suggestion for further improvement

Finally, the methodology used for determining species-specific measures could be improved in the future. A complementary approach based on cost/benefit could be developed instead of using unanimous votes to build consensus list. This cost/benefit approach should take into account the environmental impact of species, dispersal capacities, economic impacts and also positive traits/characteristics of plants. Such an approach is under preparation in the South of France (see Filippi *et al.*, 2010). However it is important to reach first a consensus.

Recommendations for the consultation phase

- Prepare a CoC in consultation with a representative sample of the horticultural sector, scientists and public authorities. The consultation phase must be planned in different steps, starting with the presentation of the environmental issue and ending with the approbation of the agreement.
- Listen to the points of view of the horticultural sector, understand how they relate to the issue and try to reach a consensus. Do not patronize or blame the horticulture industry and find solutions together. The horticulture industry also wants to protect nature. This is a common ground with ecologists/environmentalists.
- Guide the discussions so that participants propose the recommendations which will be included in the Code. The baseline of the Code will be defined with measures on which everybody agrees.
- Prepare a Code based on a multi-stakeholder approach involving diverse categories of horticulture professionals so that each actor of the ornamental sector can sign the charter. The Code must also be adapted for organizations (horticultural federations, environmental associations). If relevant prepare a Code for gardeners involving the general public.
- Codes addressed to the nursery industry and public departments should include restriction of use measures (ban from sale or planting) which are expected to be more effective for reducing deliberate introductions of invasive plants¹⁴. In this case, the list of species targeted by restrictions must be clearly defined in the Code. Restriction of use should be compensated with the promotion of non-invasive alternative plants which are profitable for the horticulture industry.
- The species targeted by restrictions of use could be selected on a two step process: first build a consensus list in consultation with the horticultural sector. Second, if data are available, apply a decision tree in order to determine the most appropriate recommendations (stop the sale/cultivation, recommendation on planting, specific labelling, etc.) considering environmental impacts, economic impacts and positive traits or functions of plants.
- Recommendations proposed in Codes should be simple, realistic and easy to apply. Codes of conduct should not include an excessive number of measures or recommendations.

¹⁴ Restriction of use of IAP is equivalent to 'pollution abatement' measures included in other voluntary schemes commonly implemented in the chemistry or energy sector.

PHASE 3: THE IMPLEMENTATION AND THE PROMOTION OF THE CODE

Drafting the Belgian CoC was only one step of the process. The next step consisted in implementing and promoting it within the horticultural sector in order to seek participation from horticulture professionals throughout the country. As recommended by Heywood (2011), communication campaigns are required in the implementation of a CoC. Coverage, publicity and information-oriented provisions feature among the criteria needed for a successful voluntary scheme (OECD, 2003). An EPPO/CoE workshop (Oslo, 2009)¹⁵ comparing national experiences and lessons learnt in developing voluntary codes 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). Several Codes or charter on IAP have failed to reach the target audience due to a lack of communication and promotion. In the United States, only 7% of nursery professionals had heard of the St. Louis Voluntary Codes of Conduct three years after its ratification (Burt *et al.*, 2007). In France several voluntary charters on IAP were drafted, but the instruments were not sufficiently promoted within the sector. Limited results were therefore achieved in terms of involvement rates of horticulture professionals.

The 'Plant different' campaign

In Belgium a specific communication campaign (entitled 'Plant different') was planned to promote the Code throughout the country. Thanks to the CoC communication campaign, 56% of nursery professionals had heard of the Code two years after its launching. Adapted communication materials were prepared. Communication materials included the project folder (75000 copies printed), the Code of Conduct (65000 copies), a poster (1000 copies) and a brochure on alternative plants (40000 copies). Materials are available on www.alterias.be. A subscription process was implemented. The Belgian Code can be signed 'manually' (paper version) or 'electronically' (online registration in the partner database available on the AlterIAS website). Communication materials were sent by post to horticulture professionals registered in the database. 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). The Code was officially launched in September 2011 during 'signature ceremonies' gathering main horticultural federations, policy-makers and partners of the AlterIAS projects. One ceremony was organized in each region of Belgium (i.e. Wallonia, Flanders and Brussels). All horticultural federations/associations signed the Code during those events. The press was invited in order to provide media coverage. Several articles were published in newspapers with a wide audience.

An active promotion was required in order to (1) inform horticulture professionals and gardeners about this new instrument (among the other charters, labels or programs dedicated to environmental protection which are already under application in Belgium) and (2) encourage/convince them to adopt it. Communication materials were sent by post to horticulture professionals who endorsed the Code. Different communication actions were used for the promotion of the Code. During this campaign, the AlterIAS project (1) published 33 articles in regional or local press and 45 articles in federation journals or horticulture magazines; (2) organized 70 conferences or information sessions; (3) participated to 45 horticultural events, 8 TV reports and 7 radio reports. There was limited involvement in the Code (i.e. limited signature) without appropriate communication. Above all, promotion required direct consultation with horticulture professionals and public green managers (via e-mails, letters, phone calls, face-to face interviews and discussions, contacts during meetings or information sessions, etc.). All contacts were registered and followed-up by the AlterIAS team.

The complete list of stakeholders involved is available in the 'Partner Database' of the AlterIAS website (www.alterias.be). Several big cities (e.g. Liège, Namur, Brussels) and big chain stores (garden centers) have endorsed the Code, such as AVEVE (170 selling points in Belgium), Intratuin (5 selling

¹⁵ http://archives.eppo.org/MEETINGS/2009_conferences/conf_codeofconduct.htm

points) or Oh!Green (5 selling points). The number of partners registered in the database is the most direct/reliable indicator of the progress of the Code. However indirect indicators such as the size of the firm should also be taken into account to assess the global impact of the Code on the horticulture market. For example, the firm Willaert is one of the biggest Belgian wholesaler which provide ornamental plants to 3000 horticulture professionals. Willaert endorsed the Code and withdrew the consensus list species out of its catalogue. The professionals registered at Willaert are indirectly impacted by the Code considering that the consensus list species cannot be ordered anymore. When such indirect indicators are taken into account (i.e. the number of horticulture professionals registered as customers of wholesalers involved in the Code), more than 3080 companies are potentially impacted by the Belgian Code of Conduct.

The Belgian CoC on IAP: results after two years of promotion

At present the Belgian CoC is the only operational instrument for self-regulating both the trade and the planting of invasive plants at the national level. On December 2013, **1022 stakeholders** had signed the Code. The stakeholders included 494 horticulture professionals (see below), 476 gardeners and 52 organizations. Thanks to the CoC communication campaign, new partners regularly signed the Code. A positive dynamic of involvement was observed over time (figure 2). The following categories of horticulture professionals were involved:

- 242 nursery men (producers, sellers, wholesalers), incl. all selling points of garden centers
- 150 public departments (cities, municipalities and provinces)
- 28 landscape architects
- 52 garden contractors
- 11 horticulture teachers
- 6 botanical gardens

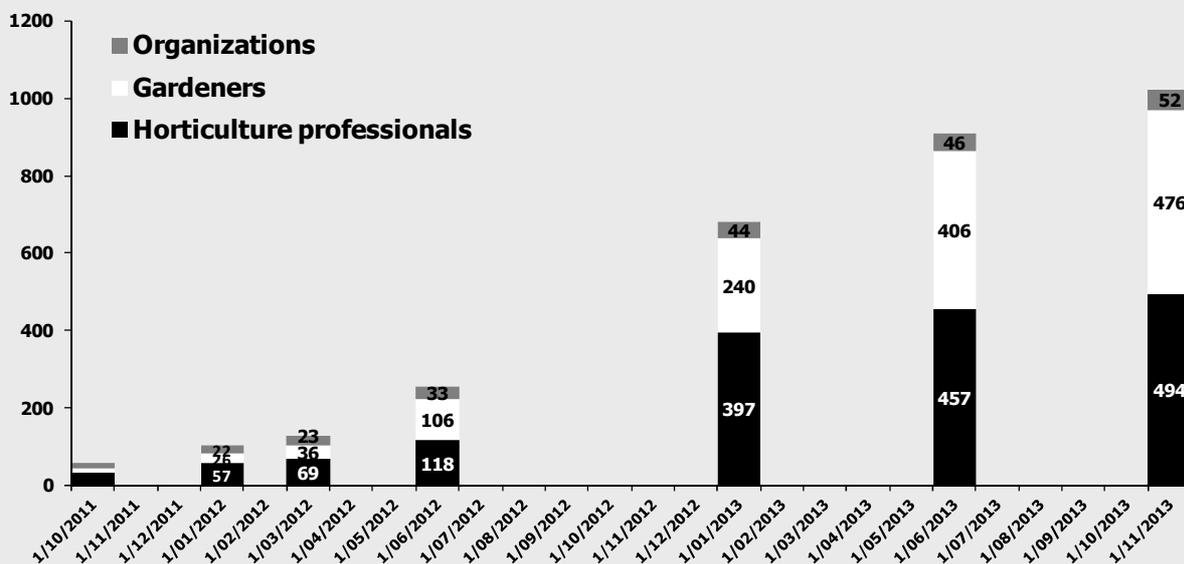


Figure 2: Evolution of the number of stakeholders involved in the Belgian CoC

Involvement rates were estimated by comparing the number of professionals involved with the number of members affiliated in organizations. Data were completed with a survey dedicated to the monitoring of the Code. Involvement rates were estimated between 10% to 30% for horticulture professionals, 25% to 35% for municipalities, 90% for provinces and 21% for botanical gardens. These results are encouraging but the Code will require more than two years to be widely adopted by the horticultural sector. An After LIFE Communication Plan [2014 – 2018] is now implemented to ensure the continuation of the Code.

Thanks to communication efforts, the knowledge of voluntary approaches such as Codes of conduct has considerably increased between 2010 and 2013. The final survey showed that 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 Code (Halford *et al.*, 2013). In the United States, only 7% of nursery professionals had heard of the St. Louis Voluntary Codes of Conduct three years after its ratification (Burt *et al.*, 2007). In England, 46% of nursery retailers were aware of the Horticultural Code of practice launched by DEFRA in 2005 (Creative research, 2009). In Belgium, the underlying reasons for adopting the Belgian Code were (1) the protection of the environment, (2) the positive publicity for the 'green image', (3) the support by federations/organizations and (4) the ease of implementation' (Halford *et al.*, 2013). The consumer/citizens pressure played a minor role in the adoption process. The support from federations and the fear of restrictive regulation was an important driver for nursery men, especially in Flanders. This confirms the need to prepare a Code in consultation with the horticultural sector in order to ensure the support from federations/associations (which in turn is a strong argument of endorsement for nursery professionals).

Results in figure 6 are encouraging, but promotion efforts must be continued. Voluntary schemes must be planned with a long-term perspective in order to progressively reach a wide proportion of stakeholders. In June 2013, there were still 44% of nursery men who had not heard of the Code. This underlines the need to continue the Code of conduct promotion campaign. Indeed, the final survey has shown that the main reasons for having not adopted the Code were (1) the lack of information (i.e. horticulture professionals were not informed about the Code) and (2) the lack of availability (i.e. horticulture professionals had no time/were too busy).

Communication actions and direct consultations

The promotion of the Code required specific human resources (2.5 full-time equivalents during two years) fully dedicated to communication actions and direct consultations. The communication tools that were most frequently used were identified in the final survey carried out by Halford *et al.* (2013). General communication actions (articles in press or in federation journals, dissemination of folders and brochures, etc.) were efficient in informing the target audience about the Code. Such actions can be considered as the first step of the promotion strategy. However general communication actions were not efficient in obtaining new signatories to the Code. Direct consultations (via e-mail, letters, phone calls, face-to face interviews and discussions, contacts during meetings or information sessions, etc.) were needed to convince stakeholders to endorse the Code. However results were limited: the success rate of direct consultations was estimated to 23% (among 426 horticulture professionals directly contacted by the AlterIAS team, 99 have signed the Code subsequently to the consultation).

Trying to convince nursery professionals to endorse a Code is a challenging task. Communication on IAP is difficult due to different public perceptions. Reactions from horticulture professionals are contrasted, ranging from a strong opposition (i.e. invasive plants are a false problem created by 'xenophobic ecologists') to an 'exaggerated' agreement (i.e. zero tolerance towards IAP, extended to all alien plants). Most horticulture professionals have a moderate opinion. Most of them agree on the invasiveness of some species, but not on all species listed by scientists. The Code was welcome differently between regions. Nursery professionals from Flanders were more skeptical. The sector is economically more developed in this region (90 – 95 % of the production of ornamental plants in Belgium is located in this region). The skepticism reflected the fear of negative impact on the business considering the restriction of use recommended in the Code. Horticulture professionals from Flanders were more critical, with sometimes a strong opposition for adopting such an instrument considered as negative for the business. However such an opposition from nursery professionals seems not justified. The final survey has shown that the measures proposed in the Belgian Code are easy to implement and not restrictive. In 2013, only 11% of horticulture professionals had encountered problems with the implementation of the Code and only 8% consider it had a negative impact on their activities (Halford *et al.*, 2013). Most nursery professionals consider the Code has no negative impact on their sale.

Few signatures occurred without consultation/communication. Contacts by the AlterIAS team were needed in order to deliver clear explanations about the Code and the measures recommended. The

lack of availability of horticulture professionals was the major constraint. The Code was generally not considered as a priority action to be undertaken compared to the daily tasks required in horticultural firms. Even when a positive answer was formulated after a consultation, professionals forgot to sign in order to make the involvement concrete (lack of time, too busy, etc.). In addition, few of them took the time to read the Code with attention. If no oral comments were delivered, the content was often misunderstood, with frequent confusion between annex I (consensus list with restriction of use) and annex II (communication list with recommendations on planting). To avoid this confusion the Code had to be revised in January 2012. The annex II was removed out of the Code and replaced by a link to the website. Indeed such a misunderstanding may have lead to a blocking situation within the sector because annex II is mostly composed of species of economic value.

The Code was better accepted by public green managers. Indeed the subscription to the Code had no financial impacts in public departments which do not sell plants (which in turn was a strong argument for adopting it). However the subscription process was time consuming for public departments such as municipalities or provinces. This is due to the administrative procedure needed for adopting the Code (i.e. the approbation from the municipal or provincial council). The decision procedure required a period of 3 weeks to 6 months, with an average duration of 3 months. The promotion through Emails or letters to affiliated members of horticultural associations had limited effect, especially for nursery professionals, garden contractors and landscape architects. Mails and attachment are not often read. Two-way communication methods (direct contacts by phone, during meetings or conferences, working group discussions, etc.) should be preferred to convince horticulture professionals.

No massive endorsement was observed with gardeners. Despite communication efforts, only a small proportion of gardeners were reached by the CoC promotion campaign. Indeed gardeners gather millions of people in Belgium. The information delivered was probably 'diluted' among the mass of people to reach. In 2013, 24% of gardeners had heard of the Belgian CoC and 23% claimed they had endorsed it. Communication campaigns targeting the general public at a national scale require specific resources, including a frequent use of mass media¹⁶ and new web-related tools (social networks, i-phone applications, etc.). A specific communication campaign is required for gardeners.

Organizations (horticultural federations, environmental associations) play a major role as multipliers of information and as 'advocates' or 'ambassadors' of the Code. In Belgium organizations can also sign the Code even though they do not plant or sell plants. When a federation signs the Code, the organization agrees to promote it to their affiliated members and/or network of partners. They have the power of encouraging horticulture professionals and public departments to adopt the instrument. In any communication campaign, nothing works better than getting someone else to say the message for you (Gellis communication, 2007)¹⁷.

Positive communication

The communication strategy with horticulture professionals should be based on positive messages focused on bringing solutions instead of highlighting the problems. It is recommended to promote the Code with engaging messages asking for behavior change and participation in biodiversity conservation. The use of alarming terms with exaggerated impacts on biodiversity, logo's focused on "don't" messages or military metaphors are not appropriate. In Belgium, even terms like 'black list species' were negatively perceived by most nursery professionals who have cultivated some of these 'black list' plants for years. The 'black list/watch list' terminology should be reserved for use within the scientific community where these terms are accepted in risk assessment methods. Horticulture professionals often felt that negative communication was aggressive or irritating which re-enforced the feeling of being guilty instead of encouraging positive solutions.

¹⁶ Mass media is indeed an important mean for informing large portions of the public, but it is not the most accessible channel for non-specialist communicators. Journalists or TV presenters are not always interested in dealing with the IAS issue. As recommended by EPPO/CoE/UICN, adapted messages must be delivered to media: "When addressing mass media (both formal media and the many varied web-based instruments) messages should be adapted for non-specialist audiences, avoiding technical and complex language, and giving preference to 'stories' and other elements (visual and other) that make the message attractive" (recommendation n°6).

¹⁷ Scoping study for an EU wide communications campaign on biodiversity and nature (Gellis communication report, 2007).

It is also recommended to avoid confusion between non-native species (alien species) and non-native invasive species (so called invasive alien species). The problem of IAP must not be generalized to all non-native plants, as pointed out by several authors (Davis *et al.*, 2011, Filippi *et al.*, 2010, Humair *et al.*, 2013). In a recent survey performed with academic experts (invasion biologists and landscape experts), most participants stressed the need to distinguish clearly between non-native and invasive species (Humair *et al.*, 2013). Many alien species introduced in our countries do not cause any problem and have no invasive potential. In Western European countries, the majority of plants grown in fields, orchards and gardens originate from other parts of the world, are not invasive and provide important food or aesthetic services. Invasive species must therefore be judged according to their effects on native biodiversity and ecosystems, and not by their origin (Humair *et al.*, 2013).

Recommendations for the implementation/promotion phase

- Promote the Code with a specific communication campaign. Design and disseminate adapted communication materials and tools (website, folders, posters, brochures, logo, etc.). Submit the content of communication materials to representatives of the horticulture sector for approval before printings. Find the appropriate messages together.
- Plan your communication strategically: prepare a communication plan describing the communication strategy for promoting the Code (key messages, target audience, communication means, objectives, time schedule, budget, etc.) and seek for participation¹⁸.
- Ask for support and/or external assistance with communication specialists (journalists, communication officers, sociologists, advertising manager, etc.) having the knowledge in communication sciences and marketing theories. Understand the values and beliefs of the target audience in order to convey an appropriate message which will affect individuals.
- Communicate to the horticultural sector with positive messages and slogan focused on solutions (and not the problems). Nuance the issue of invasive plants considering local situations in your country. Underline the benefits and establish appropriate incentives/motivations (e.g. protection of the environment, positive 'green-business' image, preference for environmentally-safe alternative plants, etc.) and possible sanctions (e.g. implementation of restrictive regulation if voluntary Codes fail) which aim to encourage the use of the Code of conduct by the horticultural industry¹⁹. The stakeholder involved must perceive some gain from participation. Make positive publicity to professionals who endorsed the Code.
- Use the most appropriate method to promote the Code considering the objective of communication. There are adapted methods to inform or to convince. General communication actions (articles in press or in magazines, communication through folders and brochures, etc.) are relevant to inform. Direct consultations are more effective to convince horticulture professionals.
- Work in collaboration with organizations which play an important role as multipliers of information. Horticultural federations/associations are major actors to convince horticulture professionals. Find 'ambassadors' or 'advocates' of the Code within the sector.
- Set up a subscription process so that stakeholders involved in the Code can be identified and counted. The number of partners involved will be used as a reliable indicator of (1) the progress of the Code and (2) the effectiveness of the promotion campaign (see monitoring). Define quantified objectives to guide your communication strategy.

¹⁸ In accordance with the recommendation n°5 from the EPPO/CoE/UICN workshop 'How to communicate with pests and invasive alien plants': "effective communication requires the definition of target audience, objectives, clear messages and the tools to be used, and evaluation of the outcomes; it is important to involve professional staff with adequate skills and to take into account existing experiences around the world".

¹⁹ Recommendation n°12 from the EPPO/CoE workshop on Codes on conduct on horticulture and invasive alien plants.

PHASE 4: THE MONITORING OF THE CODE

The monitoring should be considered as a necessary step when implementing Codes of conduct. Determining the effectiveness of a voluntary Code (and the related communication campaign) is a key component of every communication strategies. Surprisingly, such assessments are poorly documented in the literature. Although it is logical and strongly recommended, in practice it is often forgotten (Hesselink *et al.*, 2007) or underestimated. It is therefore recommended by EPPO/CoE to set measurable goals to be achieved by the horticulture industry and monitor the effectiveness of Codes of conduct by a third and independent party²⁰. However, the effectiveness of voluntary codes is difficult to evaluate with precision: without an underpinning regulatory framework, there are identified risks of 'free-riding' and regulatory capture (Shine *et al.*, 2010).

Criteria for evaluation

Goals should be defined and/or evaluated with a long-term perspective. Codes of conduct on IAP have two main goals: (1) raise awareness among horticulture professionals and (2) reduce deliberate introductions of invasive plants. Indicators must therefore be defined with appropriate methods in order quantify if these objectives are reached. A number of criteria have been proposed for the normative evaluation of alternative environmental policy instrument. These include environmental effectiveness, economic efficiency, administrative costs, effect on competition, dynamic effects and innovation incentives, soft effects and diffusion of information, and political acceptability (Bohm *et al.*, 1985 and OECD, 1999, quoted by Alberini *et al.*, 2002). In the context of voluntary approaches, however, the success is usually assessed with two components: (1) the environmental effectiveness and (2) the economic efficiency (i.e. cost-efficiency based on a cost-benefit analysis).

The economic efficiency

According to Börkey *et al.*, (2000), costs variables are more difficult to identify. It is therefore not surprising to note the lack of empirical evidence of economic efficiency of VAs. Alberini *et al.* (2002) even stated that there have been no statistical analyses of the cost effectiveness of voluntary environmental approaches. Dresselaers *et al.* (2012) tried to assess the economic efficiency of the Belgian CoC on IAP through a cost-benefit analysis based on simplified hypothesis taking into account the supposed ecological benefits of the Code (i.e. a reduction of introduction rates of invasive plants)²¹ and costs related to the control of invasive plants compared to the costs related to the implementation of the Code.

Without surprise, they conclude that the costs required for the implementation of a voluntary Code are much lower than the costs needed for the control of IAP at a national level. The budget needed for the preparation (including the initial survey, the socio-economic assessment), the consultation, the implementation (including the costs of communication tools) and the monitoring of the Belgian Code of conduct (i.e. the final survey) cost about 450 000 EUR. On the other hand the management of invasive plants cost several millions of even billions of EUR²². The costs needed to prepare and promote a Code were therefore marginal when compared to management costs related to the control of IAP. However these figures are significant under-estimates. Information on ecological and economic impacts is only available for about 10 per cent of the nearly 11,000 alien species already present in Europe (Vilà *et al.* 2009, quoted by Shine *et al.*, 2010). This underlines the difficulty for providing a relevant cost-efficiency analysis which take into account control cost.

²⁰ Recommendation n°17 from the EPPO/CoE workshop on Codes on conduct on horticulture and invasive alien plants.

²¹ Considering the measure of restriction of use of species included in the Belgian Code which recommends a "reduction rate" of 44% of invasive plants. Business as Usual scenario were built by Dresselaers *et al.* (2012) in order to assess the level of introduction rates that would result under the voluntary Code, as compared to the level that would result without it.

²² For instance, in Germany, the control cost of *Heracleum mantegazzianum* has been estimated to 12 millions € per year (Reinhardt *et al.*, 2003). In the United Kingdom, it has been estimated that it would cost about £1.6 billion (around 1.9 billion €) to eradicate *Fallopia japonica* (Williams *et al.*, 2010). In Belgium no data on costs are available at the national or regional level (Vanderhoeven *et al.*, 2006). Most data are species-specific and limited to local scales.

The environmental effectiveness

The environmental effectiveness hinges on the level of environmental protection that is realized, which in turn depends on at least three factors cited by Alberini *et al.* (2002):

- the number of 'polluters' or stakeholders that participate in the program;
- the amount of 'pollution abatement' undertaken by each participating 'polluter' or stakeholder;
- the impact that the approach has on the number of firms.

These indicators can be transposed to a CoC on IAP. The number of horticultural firms involved in the Code is the most direct indicator to assess the dynamic of involvement over time (see figure 2). Following the marketing theory, the first implementation of a Code of conduct could be compared to an innovation or a new product available in the market. The dynamic of involvement should follow the theoretical life cycle of a new product. According to Rogers (quoted by Hesselink *et al.*, 2007)²³ the spread of any innovation usually starts with a very small group of people who are called 'innovators' or 'pioneers' which direct first efforts. Others in society watch to see the results. If the first efforts are successful, others may follow the example.

It is therefore necessary to set up a subscription process allowing to count the number of firms/institutions (nurseries, garden centers, public departments, etc.) which have adopted the program. Quantified (and realistic) objectives must be defined. At the end of the AlterIAS project (in December 2013), it was expected to reach involvement rates of 20% of for horticulture professionals affiliated in federations and 60% for public green managers working in cities and municipalities. Long-term objectives must also be defined. However, according to Alberini *et al.* (2002), evaluating a voluntary program on the basis of participation alone is inappropriate. This information must be coupled with information about abatement per firm.

The number of species targeted by measure of restriction of use is equivalent to the 'pollution abatement' measure included in other voluntary schemes. The number of species included in consensus lists can be used as a reliable indicator of the environmental impact of the Code. Codes are expected to be more effective for reducing deliberate introductions of invasive plants if such measures are clearly defined.

The assessment of behavior changes

Codes also have a goal of awareness-raising. Changes of attitudes between can be quantified through social surveys aiming at assessing the perception of (1) the IAP issue and (2) voluntary tools such as CoC on IAP. 'Before/after' surveys (i.e. *ex ante/ex post* monitoring) are relevant methods to evaluate behavior changes. At the beginning of the AlterIAS project, an initial survey was addressed to horticulture professionals and gardeners (see frame page 8). A similar survey was addressed at the end of the project (see frame page 25). The final survey also included a part dedicated to the monitoring of the Code in order to know if stakeholders have encountered problems with the implementation of the Code, why they have endorsed it, if the instrument had a negative/positive impact on their sale and/or activities, etc.

The impact of communication actions

In addition the impact of communication actions disseminated during the promotion campaign must be quantified in order to assess the number of persons reached or potentially reached. Indicators of impact must be collected such as the audience of TV reportages, the number of visitors on websites, the number of copies of articles published in newspapers or magazines, the number of participants to conferences, etc. Examples of indicators are provided in table 6. Direct consultation is the most effective method to encourage the adoption of the Code by horticulture professionals. Direct consultations include direct contacts by phone or through face-to-face interviews, contacts through discussions during meetings or events, contacts by Emails, letters, etc. The number of professionals

²³ Rogers E. (1995). *The Diffusion of Innovations*, The Free Press, NewYork, 4th edition (quoted by Hesselink *et al.*, 2007).

contacted should be registered and followed-up in order to assess the success rate of direct consultation.

Table 6: Examples of indicators of impact of communication actions

Communication action	Indicator of impact
Articles (in press, magazines, federation journals, etc.)	Number of copies printed
Folders, brochures	Number of copies disseminated
TV and radio reportages	Audience
Horticultural events	Number of visitors
Information sessions/conferences	Number of participants
Website	Number of visitors

The tricky issue of control

The question of control (i.e. inspection) of voluntary Codes on IAP remains an open question. In Belgium no data were collected on this specific point. No inspection were conducted within firms in order to check if invasive alien plants which were the object of a restriction (i.e. consensus list species) were really withdrawn from sale/or planting. The progress of the Code was monitored through (1) the partner database and (2) a survey. A control could be realized through a visit in nurseries. If results reveal non respect of the commitment, a complementary survey is required in order to analyze the underlying reasons: lack of communication from the manager to the personnel who order plants in the firm, remaining stock of plants to sold out (as authorized in the Belgian Code), confusion between the species (i.e. confusion with synonyms) or green washing from horticultural firms. A warning system could also be planned with federations in order to make sure the affiliated professionals will respect the commitment in the future.

In Belgium, horticultural federations did not agree with the idea of control-inspection which has a negative connotation of sanction and was therefore considered as contradictory with the principle of a voluntary Code based on free endorsement. On top of that the AlterIAS team had limited resources to conduct such a control throughout the country. The idea of a positive monitoring was preferred (i.e. a prepared and announced visit in nurseries with the aim of supporting and understanding the involvement of horticulture professionals). It was also recommended to encourage auto-monitoring by firms themselves (i.e. a reporting or a testimony from nursery professionals about the measures they have implemented), with an incentive from horticultural federations or administrations (i.e. a reward through an article in press or in a federation journals, a positive publicity through TV reportages, a 'certificate' delivered during an event, etc.).

In The Netherlands, a control procedure was implemented within the frame of the negotiated agreement on aquatic invasive alien plants. The control was part of the agreement. All partners agreed that a monitoring system should be put in place with the aim to check the effectiveness of the Code. Monitoring was agreed upon beforehand (with no penalties if disregarded) and controls were therefore considered as part of the code. Controls were carried out by officers of the Food and Consumer Product Safety Authority (NVWA). Positive results were obtained with respect to the withdrawing of plants from sale. Most nursery professionals engaged in the Code respected the commitment (almost 100%), Quantified data were collected by Verbrugge *et al.* (2013). This demonstrates that voluntary instruments can efficiently contribute to reduce the sale of invasive plants on a large scale (i.e. at a national scale).

However the results obtained in the Netherlands may not necessarily be applicable to the work in other countries and results may depend on the type of voluntary approaches implemented. Other results could have been reached with Codes that stakeholders can sign knowing that it will not be checked. The feasibility of carrying out such a check also depends on number of partners involved and the resources available within the institution in charge of the monitoring (Verbrugge, pers. comm., 2013). The Dutch agreement targeted a limited number of nursery firms specialized in aquatic plants. Officers from the NVWA were able to monitor them all.

Recommendations for the monitoring phase:

- Choose the appropriate method of monitoring (count of stakeholders involved, socio-economic surveys, auto-monitoring by firms, inspection by qualified officers, etc.) depending on the type of voluntary approach implemented (public voluntary scheme, negotiated agreement, etc.).
- 'Before/after' survey methods (i.e. *ex ante/ex post* monitoring) are recommended to quantify changes of attitudes. Find an appropriate investigation method to assess if species targeted by restriction of use are removed from sale by nursery professionals involved in a CoC.
- Attribute the monitoring to a third and independent party or to a steering committee in charge of evaluating the progress of the Code at regular periods of time. Publish and disseminate the results.
- Define indicators to assess (1) the progress of the Code (i.e. the number of stakeholders involved) and (2) the impact of the promotion campaign (i.e. the target audience reached by the communication actions). Quantify the success rate of direct consultations implemented with horticulture professionals.
- Define objectives in a long-term perspective. Codes will require several years to be widely adopted/accepted by the horticultural sector at a large scale (i.e. at a national level).

Changes of attitudes and perception of the Belgian Code of conduct on invasive alien plants by horticulture professionals

A final survey was performed at the end of the AlterIAS project (in 2013) in order to evaluate (1) the changes of attitudes of the target audience (i.e. evolution of the level of knowledge on IAP, need for information, awareness, concern, etc.) and (2) the perception of the CoC by horticulture professionals (Halford *et al.*, 2013). Changes of attitudes were quantified by comparing the results of 2013 with the initial survey carried out in 2010. A total of 1275 surveys were compared. Positive results were observed with horticulture professionals:

1. Communication has increased the level of knowledge of this target group: in 2013, 80% of nursery men had a correct level of knowledge of the concept of invasive plants (compared to 60% in 2010). In addition results showed a better knowledge of the list of invasive plants in Belgium: 28 invasive plants were correctly cited as examples by respondents in 2013 (compared to 17 species in 2010).
2. Horticulture professionals were better aware of the ecological issue related to invasive plants. When defining invasive alien plants, the percentage of respondents who spontaneously cited negative impact on biodiversity has increased by 17%.
3. The availability of information has increased by 30%: in 2013, 88% of horticulture professionals have been informed on invasive plants (compared to 59% in 2010). The need for information has been fulfilled: most horticulture professionals (64%) felt enough informed about invasive plants in 2013 (compared to only 34% in 2010).

These results suggest that communication is effective in raising awareness when the target audience is clearly defined. This was the case with horticulture professionals affiliated in federations. Main reasons for adopting the Code were (1) the preservation of environment, (2) the positive publicity positive for the green image, (3) the support from horticultural federations/associations and (4) the ease of implementation. The support from federations and the fear of restrictive regulation play a more important role for nursery men. This underlines the need to prepare a Code in consultation with the horticultural sector in order to ensure the support from federations/associations, which in turn is a strong argument of endorsement for nursery professionals. Main reasons for having not adopted the Code were first the lack of information (i.e. professionals were not informed about the existence of the Code) and second the lack of availability of horticulture professionals (i.e. professionals were too busy).

The Belgian Code is not restrictive and easy to implement: only 11% of horticulture professionals have encountered problems with its implementation and 8% considered that the Code has a negative impact on their activities. The knowledge of measures recommended in the Code was moderate. Three measures (out of 5) were more frequently cited: (1) 'stop the sale and/or planting of invasive plants', (2) 'disseminate information on invasive plants' and (3) 'promote the use of alternative plants'. This suggests that Codes of conduct should not include an excessive number of measures or recommendations, but a limited number of measures easy to remember and implement. The measure implying restriction of use of a species ('stop the sale and/or planting) was quoted by 81% of nursery men, 60% of public green managers and 46% of private managers. All horticulture professionals (100%) involved in the Code had disseminated information on invasive plants to customers or general public. The communication methods most frequently used were (1) 'distribution of folders and brochures'; (2) 'display the Code of conduct poster' and (3) communication on annex II species'. For more information, the report is available on www.alterias.be.

RECOMMENDATIONS TO IMPROVE THE EFFECTIVENESS OF CODES OF CONDUCT

Criterion for a successful voluntary program

As stated in the introduction, different types of Codes of Conduct or Codes of Practice on IAP are implemented throughout the world. Some experiences were considered as a success, while others as a failure. The effectiveness of other initiatives currently on progress still needs to be proven in the long-term. According to the recommendations from the OECD report²⁴, Moss *et al.* (2005) proposed the following criterion required for a successful voluntary program:

- clearly-defined targets²⁵ and long-term objectives²⁶;
- credible regulatory threats from public authorities (if the objectives are not reached);
- third party participation (independent part) to implement the Code;
- penalties for non-compliance²⁷;
- information-oriented provisions;
- sufficient industry coverage and publicity;
- appropriate administration (of the horticulture industry);
- monitoring and review.

A necessary (but not sufficient) condition for a VA to be successful is that there be adequate incentives for participation, i.e., the polluters or stakeholder must perceive that there is some net benefit or gain (or at least no net loss or additional working load) that they will realize from participation (Alberini *et al.*, 2002). That gain can come from a variety of sources, including:

- environmental stewardship (i.e. personal satisfaction from protecting the environment);
- market-based incentives (i.e. 'green' preference for environmentally-friendly products);
- government-created incentives (positive or negative incentives)²⁸;
- free-rider incentives;
- adapted targeting (i.e. multi-stakeholders approach).

Additional recommendations

Considering the lessons learned from the Code of conduct implemented in Belgium and the evaluation report from Dresselaers *et al.*, (2012), additional recommendations can be delivered to improve the effectiveness of CoC in the future:

- Codes with individual commitment should be preferred. Signed Codes involve a voluntary and moral commitment from an organization or a firm to implement the agreement. Such Codes of conduct are different from other Codes where no commitment is taken. Codes without individual commitment are expected to have limited effectiveness because there is no trace of the commitment. The impact of such instruments is difficult to quantify (number and type of stakeholders involved). Indeed the effectiveness of voluntary approaches depends on the number of stakeholders involved. A subscription process (online or paper subscription procedure) must be set up, with a multi-stakeholder approach involving main actors of the horticultural sector.

²⁴ See OECD (2003). The study found limited evidence of environmental effectiveness of voluntary agreements (VAs). Shine *et al.* (2010) claimed that VAs were likely to generate significant 'soft effects' for dissemination of information and awareness-raising but seemed to provide little incentive to innovate and could be weakened by a lack of credibility. Their ability to reduce administrative costs remained an open question and transaction costs needed to be evaluated. 'Free-riding' and regulatory capture could seriously reduce their effectiveness.

²⁵ The species targeted by the Code should be clearly defined (and more specifically the species targeted by restriction of use measure).

²⁶ For instance the number of horticulture professionals to reach.

²⁷ Such a recommendation is theoretically attractive but difficult to implement in practice with voluntary CoC on IAP.

²⁸ Examples of positive incentives are financial subsidies or cost-sharing-scheme; negative incentives are regulation threats or threats to impose a more restrictive policy.

- Codes addressed to the nursery industry and public departments should include measures of restriction of use of species (i.e. ban from sale/planting) which are expected to be more effective for reducing deliberate introductions of invasive alien plants. In this case, the list of species targeted must be clearly defined in the Code. Such a list must be built in consultation with the horticultural sector (i.e. concept of consensus list). As pointed out by Dresselaers *et al.* (2012), species of most concern for an effective preventive strategy should be included in consensus lists (i.e. species still used as ornamentals but not yet widespread in nature). The authors recommends to include invasive plants from the alter list of the *Harmonia* information system (i.e. species not yet naturalized in Belgium) in the consensus list. Restrictions must be compensated with the promotion of non-invasive alternative plants which are profitable for the horticulture industry.
- Communication campaigns must be considered as a necessary phase of the implementation of a CoC. There is limited involvement from horticulture professionals without an appropriate communication. Different communication tools and methods must be used. Communication with the horticultural sector must be focused on positive messages highlighting realistic solutions and encouraging participation to the program.

Perspectives for the future

Changing people's attitudes is a long-term process for every issue related to biodiversity conservation. The Code of conduct implemented during the AlterIAS project must be considered as a first step of a progressive awareness-raising approach which will continue in the future. The Belgian Code is now included in an After LIFE Communication Plan [2014 – 2018] which was implemented in order (1) to continue the dissemination of information and (2) make durable the actions developed during the project.

The continuation of the Code is a key action of the After LIFE Plan available at www.alterias.be. At present this is the only instrument for self-regulating both the trade and the planting of invasive plants at the national level. The instrument will still be operational in the future. The AlterIAS website and the Code of conduct partner database will be maintained at least for the next five years. The Code will be taken in hand by regional administrations. Horticultural federations will ensure the promotion to horticulture professionals through communication actions defined in the After LIFE Plan. A permanent dynamic dialogue between actors will be installed and maintained under the responsibility of both administrations and federations. A revision process is planned every three years. The first revision of the Code is planned in 2016. The progress of the Code will be evaluated annually by a CoC steering committee. A final monitoring of the Code is planned in 2018.

Acknowledgements

The authors are grateful to the EPPO Scientific Officers who reviewed some parts of this note published in the EPPO Bulletin. Comments received from the EPPO Scientific Officers have been incorporated into this note.

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