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OECD SURVEY ON EDUCATION, TRAINING AND CERTIFICATION OF AGRICULTURAL PESTICIDE USERS, TRAINERS AND ADVISORS, AND OTHER PESTICIDE COMMUNICATORS: SURVEY RESULTS

INTER-ORGANIZATION PROGRAMME FOR THE SOUND MANAGEMENT OF CHEMICALS

A cooperative agreement among FAO, ILO, UNEP, UNIDO, UNITAR, WHO, World Bank and OECD

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FOREWORD

This document is the report of the "OECD Survey on Education, Training and Certification of Agricultural Pesticide Users, Trainers and Advisors, and Other Pesticide Communicators" that was carried out between April and August 2009. Thirteen countries participated in the survey: Australia, Belgium, Canada, Germany, Ireland, Japan, the Netherlands, New Zealand, Norway, Slovenia, Sweden, Switzerland, and the United States.

The objectives of the survey were to learn about OECD member countries' approaches to pesticide training and certification and determine how to measure the effectiveness of training and its effects on health and the environment.

The United States compiled the results and presented a summary of the results at the Risk Reduction Steering Group (RRSG) meeting, on 18 November 2009, in Tokyo, Japan. In view of the importance, usefulness and interest of the information collected, the RRSG recommended that a survey report be prepared. The US kindly offered to further work on this and drafted this report, which was reviewed by RRSG members by email in February-March 2010. Comments received by the RRSG have been incorporated in the attached report.

The 25th meeting of the Working Group on Pesticides approved the draft survey report in May 2010 and recommended that it be forwarded to the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, for consideration as an OECD publication.

This document is being published under the responsibility of the Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology, which has agreed that it be unclassified and made available to the public.

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SUMMARY

1. Through this survey questionnaire 13 countries have each:

- described the training and certification schemes for agricultural pesticide users and different types of pesticide communicators (e.g. trainers & advisors, master trainers, distributors) in their country, and
- identified those training topics that offer the greatest impact on health and the environment.

2. To address the desire and need for safe and proper pesticide use by numerous agricultural pesticide users in these countries, the government authorities in most countries have restrictions on the purchase and/or use of all or certain agricultural pesticides. Countries believe users are well trained with a range of academic degrees and experience and participate in training and certification programmes that are organized primarily by government agencies, agricultural extension services and universities.

3. Countries selected a broad range of training topics that are important and relevant for affecting user practices. Those topics which have the greatest impacts affecting user and public health and the environment are use of PPE/clothing, drift control/off-target application, protection of the environment, application equipment/calibration and labelling compliance.

4. Trainers and advisors in government/extension services and the private sector in most countries have qualifications at the masters/doctorate, university/college degree, or vocational levels. Government/extension, universities and other educational institutions are primarily responsible for training and certification. Some countries have a certification or accreditation system for master trainers in government or the private sector. These trainers generally have a high level of academic qualifications.

5. Pesticide communicators other than trainers and advisors, including distributors, manufacturers and researchers, have various levels of academic or experience qualifications. Some countries have training programmes and certification requirements that are equal to or similar to those for users and trainers/advisors. In addition to these formal training programmes countries identified a variety of other sources and entities that provide information on safe and proper agricultural pesticide use.

BACKGROUND

6. The OECD Pesticide Risk Reduction Steering Group (RRSG) agreed to conduct a survey of OECD member countries to learn more about their approaches of educating, training and certifying agricultural pesticide users, trainers and advisors, and other pesticide communicators. The RRSG's decision to conduct this survey followed two seminars on the subject of training:

- a seminar on "Risk Reduction Through Better Training and Worker Safety," March 2007, Brno, Czech Republic, and
- a seminar on "Risk Reduction Through Education/Training the Trainers," November 2007, Mexico City, Mexico.

7. The objectives of the survey were to learn about OECD member countries' approaches to training and certification and determine how to measure the effectiveness of training and its effects on health and the environment.

8. Several delegations, including Australia, Belgium, Canada, Germany, United States and FAO, contributed to the design and development of the survey questionnaire during 2008.

9. The questionnaire focused on four topics, corresponding to a category of pesticide users or communicators, with a series of questions in each topic:

- Agricultural Pesticide Users
- Pesticide Trainers and Advisors
- Pesticide Master Trainers, and
- Other Pesticide Communicators.

10. A copy of the questionnaire is included in Annex 1.

DEFINITIONS

11. The questionnaire included a definition of terms to facilitate a common understanding of the questions, as follows:

- **Agriculture:** includes crop and livestock production, pasture and rangeland, horticulture, forestry, crops in greenhouses, and off-farm storage of pesticides.
- **Agricultural pesticide user:** person who mixes, loads and/or applies agricultural pesticides (for professional use). Includes both the person who makes the decision on pesticide use and the equipment operator who only carries out the application (e.g. contractor or hired labour).
- **Pesticide use:** includes all types of application (e.g. aerial, ground, foliar application, ground incorporated, etc.).

- **Trainer:** person who trains pesticide users on the proper use of pesticides (and related equipment to reduce related risks and increase efficiency).

- **Advisor:** person who advises pesticide users on the proper use of pesticides (and related equipment to reduce related risks and increase efficiency).

- **Master trainer:** person who trains the trainers (and advisors).

- **Other pesticide communicator:** person who is in contact with pesticide users regarding pesticide use (e.g. seller or distributor of pesticides and of application equipment) but whose main function is not to provide training/advice on the proper use of pesticides.

SURVEY RESULTS

12. Thirteen countries responded to the questionnaire between April and August 2009: **Australia, Belgium, Canada, Germany, Ireland, Japan, The Netherlands, New Zealand, Norway, Slovenia, Sweden, Switzerland**, and the **United States**. The United States compiled the survey results, presented a summary of these results (Annex 2) at the RRSG meeting, 18 November 2009, Tokyo, Japan, and drafted this report, which was reviewed by member countries before finalization.

13. The following text is a summary of the compiled responses to the questionnaire. It is important to note that respondents used available data, estimates, best professional judgment or did not provide answers to certain of the 65 questions likely due to the absence of data.

14. The results below are presented according to the different categories of users and communicators.

Agricultural Pesticide Users

Number of users

15. The countries' responses to the questions for this topic provide quantitative and qualitative descriptions about agricultural pesticide users in the 13 countries. The reported estimates of the number of agricultural pesticide users in each country range from 29,000 (Sweden) to 3,000,000 (Japan); Japan and the United States (2,200,000) both reported their numbers as "farmers" and "farms," respectively, assuming each farmer or farm would account for one pesticide user. The total number of agricultural pesticide users for these countries is 6,471,556.

Certified users

16. All responding countries, except Japan, reported they have restrictions that limit the purchase and/or use of certain pesticides by certified/qualified users, and all countries but Ireland and Japan require "all" or "certain" agricultural pesticides users to be trained and/or certified. Countries also reported the number of users who have been certified through an accredited programme -- <1,000 (Ireland) to 920,000 (United States); the total is 2,135,600 certified users.

17. Countries reported their numbers of users certified in 2008 as 150 to 45,000 with a total of 133,001.

18. Only Germany and Switzerland reported high percentages (72 and 80%, respectively) of their users as automatically qualified users through an accredited vocational degree; the other countries reported that none to only a few percentage of its users are automatically qualified. Asked to quantify the number of users with no accredited vocational (i.e., professional) training or certificate, countries provided diverse responses: 3 unknown; 4 none; and the rest 25% to 45%.

Users' qualifications

19. Agricultural pesticide users in these countries are reported to have a variety of academic or vocational qualifications ranging from no license or recognized qualification to a masters or doctorate degree. Vocational degree, trade/industry qualification or university/college degree accounted for most of the reported qualifications of users.

Certification and training programmes for users

20. All countries, except Ireland, have government certification programmes. These programmes require 0 to 120 hours of training for certification of a user. The United States has a government programme, however users are not required to take training but must take and pass an examination to become certified. The content of the countries' programmes include theoretical and practical training and exam, information on pesticide products and equipment and a variety of other topics such as IPM, biology of pests and worker protection.

21. Government plant protection and agricultural extension services, as well as educational institutions, are more likely responsible for organizing and training and/or examination of users than other organizations, although those programmes by educational institutions may or may not be monitored by a government or industry board/body. Nine countries require "refresher" (i.e. additional) courses every 1 to 10 years (average 5 years). In addition to the government programmes, countries reported some users also attend voluntary training programmes offered by government and extension service, pesticide manufacturers and retailers and other organizations.

Effectiveness of agricultural pesticide user education, training and certification

22. Countries were asked whether they thought their current training/certification programmes were effective and had a significant impact on user practices. Seven countries reported they include post-training evaluations, field audits or other activities to judge whether users are following the instruction provided to them.

23. Countries rated 12 training topics as having high or low impact on agricultural pesticide user practices (Table 1). Generally, countries assigned a rating of high impact to all topics (with a few ratings of low, medium or no responses) and agreed that training as delivered is relevant. Countries also selected those training topics which they believe have the greatest impact on agricultural pesticide use that affect user health, public health, and the environment. The frequencies countries selected these topics are recorded in Table 1.

Table 1. Countries' Selections of Training Topics that Have the Greatest Impacts on User Health, Public Health or the Environment.

Training Topics	Affect User Health	Affect Public Health	Affect the Environment	Frequency Totals
Drift control/off-target application	3	**11**	**6**	20
Applic.equip./calibration	6	5	**7**	18
Labeling compliance	4	3	**6**	13
Protect environment	0	4	**8**	12
Exposure reduction	7	2	3	12
Professionalism	2	5	4	11
Use of PPE/clothing	**9**	0	0	9
Point source pollution	0	4	4	8
Pest management	1	3	3	7
Response to accidents	2	2	3	7
Laws/regulations	2	2	2	6
Other	IPM, Storage/Disposal, case studies, low risk products	IPM, Storage/Disposal, low risk products, posting, pre-application site assessment	IPM, Storage/Disposal, low risk products, mixing/loading	

24. The topics are listed in rank order as determined by the frequency of selections of total high impacts; frequency totals are provided in the far right column.

- The training topic, **Use of PPE/clothing**, received the highest number of selections by countries for *affecting user health.*
- The topic **drift control/off-target application** received the highest number for *affecting public health*.
- The topics protection of the environment, application equipment/calibration, drift control/off-target application and labeling compliance were most commonly selected for *affecting the environment*.
- Overall, drift control/off-target application and application equipment/calibration were the most commonly selected topics having greatest impacts.
- Some countries added additional topics they thought were important, including IPM, storage and disposal, and low risk pesticides.

Training programmes and improving user/public health and the state of the environment

25. Although a number of countries keep data on training as well as monitor incidents (e.g. intoxication, poisonings, water contamination), it seems that none correlates the two data sets, i.e. derives the degree of agricultural pesticide user training with how this affects and improves user/public health and the state of the environment.

26. Then, regarding how to investigate whether a training programme contributes to improving the human health and/or the environment, several respondents recognized that this was difficult and suggested several ways:

- pre- and post-training exams or interviews
- use of untrained control group
- collection of (more) monitoring data on pesticide use
- PPE use
- label compliance
- poisoning/pollution incidents, etc.

27. Finally, when asked how to enhance the effectiveness of agricultural pesticide user training in the interest of protecting health and the environment, countries provided diverse suggestions such as:

- training should:
  - have the correct balance of theory and practice
  - be closely linked to farmers' practices
  - provide practical work and attractive examples/solutions
  - show how changes in behaviours and in application practices can make a difference
  - be repeated and followed by post-training evaluations
- alternative methods should be demonstrated to users
- on-going funding for training should be maintained
- countries should share information on successful training strategies, tools and programmes.

Pesticide Trainers and Advisors (Public and Private)

Number of trainers and advisors

28. The reported numbers of employees in government (i.e. public sector) plant protection/agricultural extension services from these 13 responding countries range from 50 to 3,000, generally correlating with the countries' reported numbers of agricultural pesticide users. Of those employees who serve as trainers or advisors, 6 countries reported that those employees were more likely to serve as advisors than as trainers, and 5 other countries reported a greater or equal number serving as trainers.

29. Regarding the number of trainers and advisors in the private sector, respondents had difficulties providing estimates in their countries; however 5 countries (Belgium, Canada, Germany, Ireland and Switzerland) indicated they had more private sector advisors than trainers.

Trainers' and advisors' qualifications

30. With regard to the academic qualifications of trainers and advisors in government/extension services and the private sector, most countries reported qualifications at the masters/doctorate, university/college degree, or vocational levels.

Certification of trainers and advisors

31. Only Australia, Canada, New Zealand, Norway and Slovenia said they have a certification program for certain or all government/extension trainers and advisors; Germany, Ireland and Sweden reported their government trainers/advisors must meet certain qualifications. Asked to quantify these trainers/advisors with certification or accreditation, Germany, Ireland and Slovenia reported 100% and New Zealand reported 200 advisors; the other 7 countries replied with "unknown" or no response.

32. More than half of the countries (8 of 13) identified the sources responsible for training and certification of government/extension trainers and advisors as the government/extension service, universities or other educational institutions; Canada also included pesticide manufacturers and professional associations.

33. Canada, Germany, Ireland, Norway and Slovenia also reported that their government trainers and advisors also participate in voluntary training, educational and other informational activities sponsored by various public (e.g. government conferences) and private (e.g. workshops organized by pesticide industries or associations) sector entities.

34. Countries also provided information about the training and certification programs for trainers and advisors in the private sector. Australia, Canada, the Netherlands, Norway and Slovenia reported they have a certification or accreditation system for private pesticide trainers and advisors and that their systems are the same or similar to their government systems. Also, Germany, Ireland and Sweden reported that while they do not have such a system they have certain requirements for private trainers and advisors. Private trainers and advisors also participate in a variety of voluntary training, education and informational activities according to Canada, Germany, Ireland, Norway, the Netherlands and Slovenia.

Pesticide Master Trainers

Number of master trainers

35. Australia, Canada, Germany, Ireland, Japan, Slovenia and the United States (as well as the Netherlands and Sweden in some way) have master trainers, those who train the trainers and advisors, in government and/or the private sector. These countries stated that most of their master trainers are in the government sector and the numbers of these trainers are relatively low, e.g., 5 in Ireland, 10 in Slovenia, and 80 in Germany to larger numbers of 150 in the US and 290 in Japan compared to all trainers and advisors as would be expected.

36. Of the 9 countries which reported and identified the employers of their master trainers, 7 stated that their master trainers are employed by the agricultural ministry or extension service (or plant protection service) at the federal or state level and 2 countries reported the employers are educational institutions.

Master trainers' qualifications

37. Most master trainers in these 9 countries have a high level of academic qualifications, i.e., masters/doctorate or university/college degree with a low percentage with a vocational degree.

Certification and training of master trainers

38. Only one country, Canada, reported having a government/provincial certification programme for pesticide master trainers which includes 8 hours of training for certification. Australia indicated it is developing a certification programme which will require 650 accredited nominal hours of training and will address the topics of risk management, legislation, environmental management, compliance and registration and facilitation.

39. Government and universities and/or other educational institutions are or will be responsible for the training for Canada's and Australia's programmes.

Other Pesticide Communicators

40. Countries were asked a series of questions about other pesticide communicators, i.e., persons who are in contact with pesticide users regarding pesticide use but whose main function is other than as a trainer or advisor on the proper use of pesticides. These persons may be distributors or sellers of pesticide products or application equipment, agricultural researchers, educators, sprayer testers and enforcement officers.

Other communicators' qualifications

41. In describing the education or qualification and training of these types of other pesticide communicators, countries reported these communicators have various levels of academic or experience qualifications, including masters/doctorate, university/college or vocational degrees, trade/industry qualifications, or simply were experienced but with no license or qualification.

Training of the other communicators

42. Responding countries' training programmes for other communicators are organized and managed in a variety of ways. For example, Australia's programme is through industry providers and technical

colleges/universities; Germany requires these communicators to have a degree or certificate from an accredited training programme and be registered with the federal states' plant protection authorities; Japan's Ministry of Agriculture, Forestry and Fisheries instructs prefectural governments to implement training and the private sector also voluntarily contributes to training activities; and, Switzerland relies on pesticide companies to train these communicators. Australia, Canada, Ireland and New Zealand also require other communicators to demonstrate ongoing professional development or current knowledge of information and standards.

Distributors

43. A specific set of questions focused on pesticide and equipment distributors because of their common presence in all countries and their somewhat unique position of having direct contact with pesticide purchasers and users and likelihood of conveying information about pesticide use.

44. Most countries provided estimates of the number of workers in agricultural pesticide distribution in their country, ranging from 30-50 (Switzerland), to 400 - 2,500 (Belgium, Ireland, The Netherlands, New Zealand and Slovenia), to 5,000 – 10,000 workers (Australia and Germany); the other 4 countries stated the number is unknown or varies. Countries estimate that 20 – 100% of their distributors provide advice directly to pesticide users.

45. Most of the countries report that they have a government certification programme for distributors and that many of these programmes are the same or similar to those for other pesticide communicators mentioned above. Countries that have a certification programme for distributors report that many or all distributors in their county have certificates, and distributors participate in a variety of certification and education courses, government and industry sponsored conferences and workshops, read professional literature and have access to the internet.

More about other communicators (not including distributors)

46. Asked about the number of other pesticide communicators, except distributors, Belgium estimated 400, Germany 500, Ireland 110, New Zealand 200 (warranted enforcement officers), Slovenia 500 and Sweden 80 (sprayer testers). Countries reported a wide range (15% - 100%) of these communicators who provide advice directly to pesticide users.

47. Some of the above-mentioned countries, and Japan, have certification programmes or special requirements for these other communicators. For example, Germany requires manufacturer communicators to have an accredited vocational degree or participate in and receive a certificate from an accredited training program which is carried out by government, universities or other educational institutions and pesticide manufactures. Japan's private sector voluntarily conducts a certification programme for pesticide manufacturers, and Sweden has a government certification programme with special training courses for sprayer testers. All or some of these other communicators in these countries and The Netherlands, New Zealand and Slovenia have certificates, and they participate in a variety of conferences, workshops and other activities sponsored by government and industry and read professional literature and may have unlimited web access.

Other Organizations Promoting Proper Use of Agricultural Pesticides

48. In addition to the above mentioned sponsors and providers of pesticide information, a number of countries also stated that other organizations (private or public, non-profit or for-profit) promote the proper use of agricultural pesticides. Countries identified organizations such as:

- Workplace Health and Safety, local government environment, health and extension offices (Australia)
- the Programme for Reduction of Pesticides and Biocides, a federal programme (Belgium)
- Farm organizations, health and safety organizations and various industry organizations (Canada)
- Professional associations (Germany)
- Industry associations of pesticide suppliers, applicators and growers (New Zealand)
- Swedish Environmental Protection Agency (Sweden)
- Service for Worker Safety in Agriculture (Switzerland), and
- Pesticide manufacturer, supplier, commercial applicator, and agricultural organizations, the Environmental Protection Agency and state and local government agencies and agricultural worker and environmental advocacy organizations (United States).

ANNEX 1

SURVEY QUESTIONNAIRE

for the OECD Survey on Education, Training and Certification of Agricultural Pesticide Users, Trainers & Advisors and other Pesticide Communicators

BACKGROUND

This questionnaire has been prepared as a follow-up activity to two Seminars of the OECD Risk Reduction Steering Group (RRSG). One Seminar dealt with "risk reduction through better training and worker safety", March 2007, Brno, Czech Republic, and the second one addressed the issue of "risk reduction through education/training the trainers", November 2007, Mexico City, Mexico. The RRSG later agreed to conduct a survey to learn more about OECD countries' approaches and in particular to a) collect information on the training schemes in OECD countries, and b) determine how to measure the effectiveness of training and its effects on health and the environment.

A number of Delegations (i.e., Australia, Belgium, Canada, Germany, US and FAO) have contributed to the development and refinement of the enclosed questionnaire.

NEXT STEPS

A compilation of countries' responses will be prepared for the next RRSG meeting (16-20 November 2009, Tokyo, Japan). The US delegation has kindly offered to prepare such compilation that should help identify further work and analysis. For example, some sections of the survey that collect mostly descriptive data could be simply summarized in tables while others may be further analyzed. Also questions 20-27 on the "effectiveness of education, certification and training" are expected to lead to a deeper analysis of the responses. In addition, it may be also worthwhile identifying relevant survey outcomes, e.g. recommending *best practices in training* (such as the ones that lead to some effectiveness with effects on health and the environment), or, as a long-term objective, designing *simple indicators* to help measure the effectiveness of training. Further discussions on the next steps will therefore take place at the November 2009 meeting of the RRSG.

NOTE TO COUNTRIES FOR COMPLETING THE QUESTIONNAIRE

Delegations are invited to participate in this survey as much as possible. Countries are encouraged to respond to the questions to the best of their professional judgment, even if it has been recognized by RRSG members that some parts might prove difficult to answer depending on each country's situation. Therefore, it is acknowledged and understood that some questions may be left blank because the issues are not relevant for some countries. Alternatively, some estimates of numbers might be provided for some answers. However, all responses will be useful to gain a full picture of OECD countries' approaches dealing with education, training and certification of agricultural pesticide users and other communicators.

Questionnaire
on Education, Training and Certification
of Agricultural Pesticide Users, Trainers
& Advisors and other Pesticide Communicators

Structure of the questionnaire

Definition of Terms Used in this Questionnaire

A. Agricultural Pesticide Users

- General Information on Agricultural Pesticide Users *(Questions 1 to 6)*
- Education / Qualification and Training / Certification / Accreditation of Agricultural Pesticide Users *(Questions 7 to 19)*
- Effectiveness of Agricultural Pesticide User Education, Training and Certification *(Questions 20 to 27)*

B. Pesticide Trainers and Advisors

- General Information on Pesticide Trainers and Advisors *(Questions 28-29)*
- Education and Qualification of Pesticide Trainers and Advisors *(Question 30)*
- Certification and Accreditation of Government Trainers and Advisors *(Questions 31 to 34)*
- Certification and Accreditation of Private Trainers and Advisors *(Questions 35 to 38)*

C. Pesticide Master Trainers

- General Information on Pesticide Master Trainers *(Questions 39-40)*
- Education and Qualification of Pesticides Master Trainers *(Question 41)*
- Training and Certification of Pesticide Master Trainers *(Questions 42 to 46)*

D. Other Pesticide Communicators

- Education / Qualification and Training of Other Pesticide Communicators *(Questions 47 to 50)*
    - Pesticide Distributors *(Questions 51 to 57)*
    - Other Pesticide Communicators *(Questions 58 to 64)*

Other Organisations *(Question 65)*

Contact Information

Definition of Terms Used in this Questionnaire

- **Agriculture**
  includes crop and livestock production, pasture and rangeland, horticulture, forestry, crops in greenhouses, and off-farm storage of pesticides.

- **Agricultural pesticide user**
  person who mixes, loads and/or applies agricultural pesticides (for professional use). Includes both the person who makes the decision on pesticide use and the equipment operator who only carries out the application (e.g. contractor or hired labour).

- **Pesticide use**
  includes all types of application (e.g. aerial, ground, foliar application, ground incorporated, etc.).

- **Trainer**
  person who *trains* pesticide users on the proper use of pesticides (and related equipment to reduce related risks and increase efficiency).

- **Advisor**
  person who *advises* pesticide users on the proper use of pesticides (and related equipment to reduce related risks and increase efficiency).

- **Master trainer**
  person who trains the trainers (and advisors).

- **Other pesticide communicator**
  person who is in contact with pesticide users regarding pesticide use (e.g. seller or distributor of pesticides and of application equipment) but whose *main* function is *not* to provide training/advice on the proper use of pesticides.

Country: _____

A. AGRICULTURAL PESTICIDE USERS

GENERAL INFORMATION ON AGRICULTURAL PESTICIDE USERS

1. Total number of agricultural pesticide users in your country: _____

2. Does your country apply restrictions to certain pesticides which limit their purchase to specific locations and/or use by certified/qualified pesticide users?
If so, please explain.

3. Does your country require some or all agricultural pesticide users to be trained and/or certified (please tick √ as appropriate)?

   _____all agricultural pesticide users must be trained and/or certified

   _____certain categories of agricultural pesticide users must be trained and/or certified (please explain)

   _____agricultural pesticide users are not required to have training or certification

4. How many agricultural pesticide users (number or percent) in your country have received a certificate through an accredited training programme?

5. How many agricultural pesticide users (number or percent) in your country are automatically qualified through an accredited vocational (i.e. professional) degree?

6. How many agricultural pesticide users (number or percent) in your country have no accredited vocational (i.e. professional) training or certificate?

EDUCATION/QUALIFICATION and CERTIFICATION/ACCREDITATION OF AGRICULTURAL PESTICIDE USERS

7. What academic or vocational (i.e. professional) qualifications do agricultural pesticide users have in your country? (please tick √ and, where possible, indicate number or %)

Qualification	**Number or percent of pesticide users that have the qualification**
Masters or doctorate degree	
University or college degree (full degree below masters from an accredited school)	
Vocational degree	
Trade/industry recognised qualification, e.g. operator licence	
Experienced but no licence or qualification	
No licence or recognised qualification	
Other	

8. Does your country have a government certification programme (including training course and/or examination) for agricultural pesticide users?

____ yes ____ no (please go to question 16)

If yes (i.e. your country has a government certification programme), please answer questions 9 to 15,

9. How many hours of training (in total) are required for certification as a pesticide user? _____

10. What does the training and certification programme include? (please tick √)
_____ theoretical training and examination
_____ practical training and examination
_____ information about specific products and pesticide categories
_____ information about, and/or training in use of, specific equipment categories (e.g. manual equipment, tractor field equipment, orchard sprayers, greenhouse equipment, foggers, aircraft)
_____ general training for all equipment
_____ other? Please explain.

11. Which of the following institutions are responsible for organising the training and/or examination of agricultural pesticide users? (please tick √)

Institution	**Training**	**Examination**
Government plant protection or agricultural extension services		
Universities		
Other educational institutions		
Pesticide manufacturers		
Other		

12. Does any inter-institutional/overarching body oversee the implementation of agricultural pesticide user training/examination programme?

____ yes (please explain) ____ no

13. Approximately how many agricultural pesticide users (number or percent) participated in training/certification courses in 2008 in your country?

14. Does your country require agricultural pesticide users to attend additional ("refresher") training courses (additional to the 'standard' government certification programme)?

____ yes ____ no

15. If yes, please explain:
(i) at what intervals (i.e. how often)
(ii) the content of the additional courses

16. How many agricultural pesticide users in your country also participate in additional, *voluntary* training courses?

Voluntary training provided by:	**Average number of ag. pesticide users who attend one or more training session per year**
Government plant protection or agricultural extension service	
Pesticide manufacturers and retailers	
Other organisations (please list them)	

17. In your country, are academic/university programmes related to agricultural pesticide use monitored by any government or industry board/body? If so, please explain.

18. In your country, is vocational (i.e. professional) training related to agricultural pesticide use monitored by any government or industry organisation/body? If so, please explain.

19. Please add any additional information you believe would help characterise your country's training of agricultural pesticide users.

EFFECTIVENESS OF AGRICULTURAL PESTICIDE USER EDUCATION, TRAINING AND CERTIFICATION

20. Does your country conduct post-training evaluations, field audits, personal interviews, or other activities (e.g. statistics) to confirm that agricultural pesticide users are following what they have learned in training courses?

____ yes ____ no

If yes, please explain what your country does and what results you have found.

21. Do you believe that training in the following areas have a high or a low impact (i.e. improvement) on agricultural pesticide user practices? Explain why if possible.

a) Pest management	high	low
b) Knowledge of pesticide laws and regulations	high	low
c) Compliance with pesticide labelling	high	low
d) Reduction in exposure to pesticides	high	low
e) Use of personal protective clothing and equipment	high	low
f) Protection of the environment	high	low
g) Point source pollution/avoidance	high	low
h) Knowledge of application equipment and calibration	high	low
i) Response to spills, fire and poisonings	high	low
j) Professionalism of applicators	high	low
k) Knowledge of drift control and off target application	high	low

In view of these results, is it your opinion that training delivered is relevant?

How could it be improved?

22. Which training topics do you believe have the greatest impact on agricultural pesticide use practices that affect *user health*?

23. Which training topics do you believe have the greatest impact on agricultural pesticide use practices that affect *public health* in general (e.g. by reducing exposure of bystanders, nearby public and residents, general public)?

24. Which training topics do you believe have the greatest impact on agricultural pesticide use practices that affect the *environment*?

25. Does your country maintain relevant data that correlate the degree of agricultural pesticide user training with *user health*, *public health* in general, and/or the *environment*? (for example, data on worker exposure or incidents of intoxication, data on bystander exposure, water monitoring data)

____ yes ____ no

If yes, please explain.

26. In your view, how can one investigate whether an agricultural pesticide user training programme has contributed to improving the human health and/or the environment?

27. Do you have suggestions for regulatory authorities to enhance the effectiveness of agricultural pesticide user training in the interest of protecting health and the environment?

B. PESTICIDE TRAINERS AND ADVISORS

GENERAL INFORMATION ON PESTICIDE TRAINERS AND ADVISORS

28. Number of employees in **government** (i.e. public sector) plant protection/agricultural extension services:

_____

Of these,

How many (number or percent) work *mainly* as pesticide **trainers**?

How many (number or percent) work *mainly* as pesticide **advisors** (including warning and forecasting services)?

29. Number of **private sector** pesticide trainers and advisors in your country:

_____ trainers
_____ advisors

EDUCATION AND QUALIFICATION OF PESTICIDE TRAINERS AND ADVISORS

30. Academic or vocational (i.e. professional) qualifications of government and private pesticide advisors and trainers. Please tick √ and where possible indicate what **number or percent** of trainers and advisors have the different qualifications:

Qualification	**Government**		**Private**	
	trainers	**advisors**	**trainers**	**advisors**
Masters or doctorate degree				
University or college degree (full degree below masters from an accredited school/institution)				
Vocational degree				
Trade/industry recognised qualification				
Experienced but no licence or qualification				
No licence/recognised qualification or experience				
Other				

CERTIFICATION / ACCREDITATION OF GOVERNMENT TRAINERS AND ADVISORS

31. Does your country have a government certification or accreditation programme for government pesticide trainers and advisors?

____ yes ____ no

32. Number or percent of government advisors and trainers with a certificate or accreditation:
_____ advisors
_____ trainers

33. Which institution is responsible for the training and certification/accreditation of government trainers and advisors? (please tick √)

Institution	**Training of**		**Certification / accreditation of**	
	trainers	**advisors**	**trainers**	**advisors**
Government protection / agricultural extension service				
Universities				
Other educational institutions				
Pesticide manufacturers				
Other (please explain)				

34. To what extent do certified/accredited government trainers and advisors also participate in voluntary training, educational and informational activities? Please tick √ and where possible give the **number or percentage** of government trainers and advisors who participate annually in each type of activity:

Type of activity	**Trainers**	**Advisors**
Voluntary qualification courses or activities organised by government plant protection/agricultural extension services or institutions		
Government plant protection conferences		
Workshops, symposia and meetings organised by government plant protection/agricultural extension services		
Workshops, symposia and meetings organised by pesticide manufacturers and retailers		
Workshops, symposia and meetings organised by other organisations (please list the organisations)		
Read professional literature		
Have unlimited Web access		

CERTIFICATION / ACCREDITATION OF PRIVATE TRAINERS AND ADVISORS

35. Does your country have a certification or accreditation system for private pesticide trainers and advisors?

____ yes ____ no

36. If yes, is it the same as the certification / accreditation system for government pesticide advisors and trainers?

____ same ____ different

If different, please explain.

37. Number or percent of private trainers and advisors with a certificate or accreditation:

_____ private advisors
_____ private trainers

38. To what extent do private pesticide trainers and advisors also participate in voluntary training, educational and informational activities? Please tick √ and where possible give the **number or percentage** of private advisors and trainers who participate annually in each type of activity:

Type of activity	**Private trainers**	**Private advisors**
Voluntary qualification courses or activities organised by government plant protection/agricultural extension services or institutions		
Government plant protection conferences		
Workshops, symposia and meetings organised by government plant protection/agricultural extension services		
Workshops, symposia and meetings organised by pesticide manufacturers and retailers		
Workshops, symposia and meetings organised by other organisations (please list the organisations)		
Read professional literature		
Have unlimited Web access		

C. PESTICIDE MASTER TRAINERS

GENERAL INFORMATION ON PESTICIDE MASTER TRAINERS

39. Number of master trainers in your country:

_____ government (i.e. public sector) master trainers

_____ private master trainers

40. Which ministry or service do government master trainers work for (e.g. agricultural extension service, plant protection service, educational service)?

EDUCATION/QUALIFICATION OF PESTICIDE MASTER TRAINERS

41. What academic or vocational qualifications do master trainers have in your country (please tick √ and where possible indicate number or %)?

Qualification	**Number or percent of pesticide users that have the qualification**
Masters or doctorate degree	
University or college degree (full degree below masters from an accredited school/institution)	
Vocational degree	
Trade/industry recognised qualification, e.g. operator licence	
Experienced but no licence or qualification	
No licence or recognised qualification	
Other	

TRAINING AND CERTIFICATION OF PESTICIDE MASTER TRAINERS

42. Does your country have a government certification programme (including training course and/or examination) for pesticide master trainers?

____ yes ____ no (please go to question 47)

If yes (i.e. your country has a government certification programme for master trainers), please answer questions 43 to 46,

43. How many hours of training (in total) are required for certification of master trainers? _____

44. What does the training and certification programme for master training include?

45. Which institution is responsible for the training and certification/accreditation of master trainers? (please tick √)

Institution	**Training**	**Certification / accreditation**
Government plant protection / agricultural extension service		
Universities		
Other educational institutions		
Pesticide manufacturers		
Other (please explain)		

46. How many pesticide master trainers participated in training/certification courses in 2008?

D. OTHER PESTICIDE COMMUNICATORS

EDUCATION / QUALIFICATION AND TRAINING OF OTHER PESTICIDE COMMUNICATORS

47. Please add any categories of other pesticide communicators that you consider to be important (e.g. manufacturers, retailers). Then tick √ and where possible indicate the **number or percent** with the different qualifications:

Qualification	**Other pesticide communicators (please add)**			
	Pesticide distributors	….	…..	…..
Master's or doctorate degree				
University or college degree (full degree below master's from an accredited school/institution)				
Vocational degree				
Trade/industry recognised qualification				
Experienced but no licence or qualification				
No licence/recognised qualification or experience				
Other				

48. How is the training of other pesticide communicators organised, monitored and delivered in your country?

49. Are other pesticide communicators required to meet a minimum standard of training?

____ yes ____ no

If yes, please explain.

50. Are other pesticide communicators required to demonstrate ongoing professional development in a relevant field?

____ yes ____ no

If yes, please explain.

Pesticide Distributors

51. How many people in your country work in the area of pesticide distribution?

52. Of these, how many (number or percent) provide direct advice to pesticide users?

53. Does your country have a government certification programme or other special requirements for pesticide distributors?

_____ yes _____ no

54. If yes, what type of programme do you have?

55. If yes, which institution is responsible for training and/or examination?

Institution	**Training**	**Examination**
Government plant protection or agricultural extension services		
Universities		
Other institutions (please explain)		
Pesticide manufacturers		

56. How many pesticide distributors have certificates? (number and/or percent)

_____

57. To what extent do pesticide distributors also participate in (please tick √ and where possible indicate number or %):

Type of activity	**Number or percent of distributors**
Voluntary qualification (certification) courses or activities organised by government plant protection/agricultural extension services/institutions	
Government plant protection conferences	
Workshops, symposia and meetings organised by government plant protection/agricultural extension services	
Workshops, symposia and meetings organised by pesticide manufacturers and retailers	
Workshops, symposia and meetings organised by other organisations (please list the organisations)	
Read professional literature	
Have unlimited Web access	

Other Pesticide Communicators

Please respond <u>for each category</u> of other pesticide communicators identified in the table in Question 47.

58. How many people in your country work in this/these category/ies of pesticide communication?

59. Of these, how many (number or percent) provide direct advice to pesticide users?

60. Does your country have a government certification programme or other special requirements for this/these category/s of pesticide communicators?

_____ yes _____ no

61. If yes, what type of programme do you have?

62. If yes, which institution is responsible for training and/or examination? (please tick √)

Institution	Training	Examination / accreditation
Government plant protection / agricultural extension service		
Universities		
Other educational institutions		
Pesticide manufacturers		
Other (please explain)		

63. How many of these pesticide communicators have certificates? (number and/or percent)

64. To what extent do the pesticide communicators also participate in (please tick √ and where possible indicate number or %):

Type of activity	Number or percent who participate
Voluntary qualification (certification) courses or activities organised by government plant protection/agricultural extension services/institutions	
Government plant protection conferences	
Workshops, symposia and meetings organised by government plant protection/agricultural extension services	
Workshops, symposia and meetings organised by pesticide manufacturers and retailers	
Workshops, symposia and meetings organised by other organisations (please list the organisations)	
Read professional literature	
Have unlimited Web access	

OTHER ORGANISATIONS

65. In addition to the institutions and organisations covered in this questionnaire, do any other organisations (private or public, non-profit or for-profit) in your country work to promote the proper use of agricultural pesticides?

If so, please explain who they are and what they do.

CONTACT INFORMATION

Please provide:

Name of person completing the questionnaire

Address

Telephone number

Fax number

E-mail address

ANNEX 2

Presentation of Survey Results (slides)

OECD WGP/RRSG

Survey Results:

OECD Survey on Education, Training and Certification of Agricultural Pesticide Users, Trainers & Advisors, and Other Pesticide Communicators

OECD WGP/Risk Reduction Steering Group Meeting
Agenda Item 8a

Tokyo, Japan 18 November 2009

Survey Purpose

- Purpose: ". . . to learn more about OECD member countries' approaches and in particular to a) collect information on the training schemes . . . and b) determine how to measure the effectiveness of training and its effects on health and the environment."
- Follow-up to two prior RRSG seminars on risk reduction through better training and worker safety and education/training of trainers.

2

Design of Survey

- Four areas of focus:
  - Agricultural Pesticide Users
  - Pesticide Trainers & Advisors
  - Pesticide Master Trainers
  - Other Pesticide Communicators
- Survey questionnaire drafted by RRSG members

3

Survey Respondents

- Responses April – August 2009
- 13 countries responded

Australia	Ireland	Norway
Belgium	Japan	Slovenia
Canada	The Netherlands	Sweden
Germany	New Zealand	Switzerland
		United States

4

Agricultural Pesticide Users (Q 1-4)

- Number of users range from 29,000 to 2-3 million depending on the country.
- All countries, except Japan, reported restrictions for users.
  - Certification required for certain or all users.
- All, but Ireland and Japan, require users to be trained and/or certified.
- Each country reported having numerous trained and/or certified users (2.1 million total).

5

Academic/Vocational Qualifications of Users (Q 5-7)

- Only a few countries reported the vast majority of their users did not have a vocational degree.
- Users generally are not automatically qualified if they have an accredited vocational degree.
  - 72% and 80% of users in Germany and Switzerland are automatically qualified with accredited vocational degrees.
- Most common reported qualifications:
  - Vocational degree
  - Trade/industry qualification
  - Experienced but no license

6

Training Programs for Users (Q 8-10)

- All countries, except Ireland, reported government certification programs
- No. training hours: 0 to 120 hrs (30 ave.)
  - US does not require training, only an exam.
- All countries' training programs include:
  - Theoretical and practical training/exam
  - Information on products, equipment
  - Variety of other topics

7

Who Gives or Takes Training and Certification? (Q11-13)

Training Institutions	Countries
Government/Ag. Extension:	11
Universities:	3
Other education institutions:	7
Manufacturers (training):	3
Other:	9
Overarching Body to Oversee:	7

No. trained in 2008: 150 – 45,000 (total = 133,001!)

8

Refresher Courses (Q14-16)

- Are they required?: 9 said 'yes'
- Frequency: 1 – 10 yrs (most 5 yrs)
- Course content varies:
  - Regulations, IPM, pests, pesticides and equipment, risks, BMPs
- Number participants in voluntary training unknown by most countries.

9

Monitoring of Training Programs by Government or Industry (Q 17-20)

	Yes	No
Academic Programs	2	10
Vocational Programs	8	5

- Half the countries conduct post-training evaluations.

10

Impact of Training on User Practices (Q 21-27)

- 11 countries believe training has high level of impact on most-all topics of knowledge.
  - Laws
  - Pest management
  - Labels
  - Exposure and PPE
  - Equipment and pesticides
  - Environmental protection
  - Drift control

11

Topics with Greatest Impacts (Ranked by frequency of selection)

	Affect User Health	Affect Public Health	Affect the Environment	Frequency Totals
Drift control	3	**11**	6	20
Applic.equip/ calibration	6	5	7	18
Labeling compliance	4	3	6	13
Protect environment	0	4	**8**	12
Exposure reduction	7	2	3	12
Professionalism	2	5	4	11
Use of PPE/clothing	**9**	0	0	9
Point source pollution	0	4	4	8
Pest management	1	3	3	7
Response to accidents	2	2	3	7
Laws/regulations	2	2	2	6
Other	IPM, Storage/Disposal, case studies, low risk products	IPM, Storage/Disposal, low risk products, posting, pre-application site assessment	IPM, Storage/Disposal, low risk products, mixing/loading	

12

Pesticide Trainers & Advisors (Q 28-29)

- No. employees in Gov't, Plant Protection, or Extension Services:
  - Unknown to 5 to 3,000
  - About half countries said their employees functioned more as advisors, less as trainers.
- No. employees in Private Sector
  - Unknown to 2 to 300
  - Results less clear about advisors vs trainers.

13

Academic Qualifications of Trainers & Advisors (Q 30-38)

- Most countries reported qualifications at vocational, university, or master/doctorate degree levels for government and private trainers and advisors
  - Government:
    - Half of the countries also require a certification program for trainers & advisors.
    - Variety of institutions responsible for training.
    - Participate in variety of voluntary training activities.
  - Private sector:
    - Less than half have certification programs; same as government.
    - Participate in variety of voluntary training activities.

14

Pesticide Master Trainers (Q 39-46)

- Seven countries reported having master trainers
  - Australia, Canada, Germany, Japan, Ireland, Slovenia, US (and NL and Sweden in some way)
- Work for government agencies, universities, extension service.
- Most have at least university/college degree.
- Only one country (Canada) also requires certification.

15

Other Pesticide Communicators (Q 47- 50)

- Manufacturers, Distributors, Retailers
- Countries reported other pesticide communicators have a variety of education/training qualifications.
  - Half also have required training.
- Their training is organized, monitored and delivered by gov't, universities, industry.

16

Distributors as Pesticide Communicators (Q 51-64)

- Unknown to 30 (Switzerland) to 10,000 (Germany) + distributors.
- Most distributors give advice.
- Most countries have a certification program for distributors; variety of types.
- Government, plant protection, or extension and universities are responsible for training.
- Distributors voluntarily participate in a variety of activities.
- Data on other types of communicators is sparse.

17

Other Organizations Promoting Proper use of Agriculture Pesticides (Q 65)

- AUS – Workplace Health & Safety orgs; local environmental and health gov't agencies
- BEL – Programme for Reduction of Pesticides and Biocides
- CA N - Farm organizations, health and safety organizations and various industry organizations
- GER – Professional associations
- NZ – Industry orgs (suppliers, applicators, growers), NGOs
- SWE – Swedish Environmental Protection Agency
- SWI – Service for Worker Safety in Agriculture
- USA – Industry organizations--American Farm Bureau, commercial applicator organizations; advocacy organizations--farm work, environmental; government--EPA, US Department of Agriculture, state and local government agencies.

18

Summary (1/2)

Agricultural Pesticide Users:

- Millions of users reported.
- Many/most are experienced/educated at trade/industry level or more and trained.

Training Users:

- Governments have certification programs; included variety of topics which are similar in most countries.
- Government is most common responsible trainer.
- Refresher courses are commonly required.
- Government & industry is more likely to monitor vocational training programs than academic training programs.

19

Summary (2/2)

Training Impacts:

- Perception is training has high impacts on variety of topics.
- Knowledge of drift control and application equipment/calibration have greatest impacts protecting user, public, and environment.

Trainers & Advisors:

- Total number are likely 1,000s.
- Education level is high, many certified.
- Master trainers are uncommon among countries.

Other communicators: 1,000s, many educated/trained, in gov't, industry, users and advocacy organizations.

20