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Chemical risk in agriculture

Diversity of Farm labour situations in the EU, some consequences for designing and implementing prevention of risks

11th Seminar on workers' protection & chemicals
Dublin, 25-26 June 2015

Guidelines

- Diversity of working situations in agriculture
- Potential exposure to pesticides
- So many regulations…

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Who is working in agriculture?

In 2010

- 12 million farms in the European Union.
- Many data sources tend to agree in saying that around 10 million persons are employed in agriculture, representing 5% of total employment.
- On the other hand, the Farm Structure Survey (FSS) indicates that 25 million people were regularly engaged in farm work in the EU during 2010 (including part time activity).

Who is working in agriculture?

- Around 70% of the farm labour in seven countries
- Self employment = 75% of total employment in agriculture (16% in the total economy).
- Importance of part time and double activity

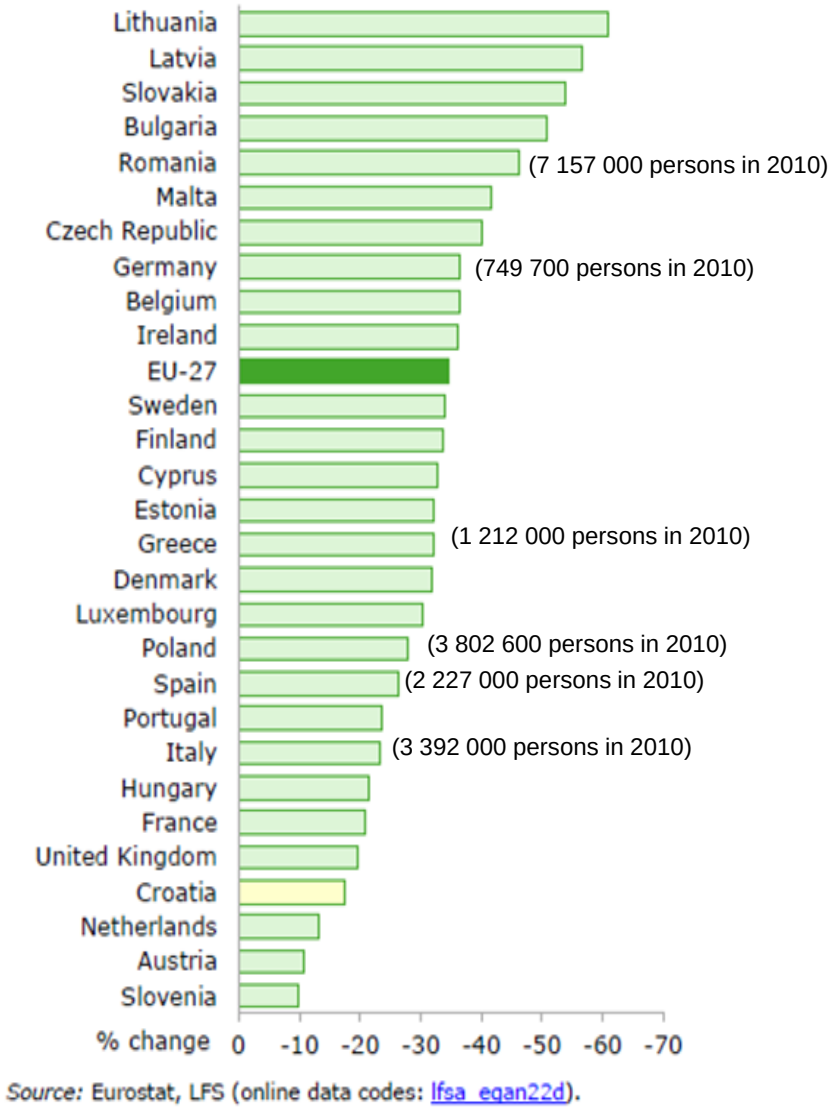
(Sources: Eurostat, various data bases; EU Agricultural Economics Briefs No 8| July 2013. How many people work in agriculture in the European Union? An answer based on Eurostat data sources)

Countries	FSS				LFS
	Total regular farm labour force	Agriculture is a minor activity*	Agriculture is a secondary activity*	Agriculture is the main activity*	Total employment
	2010				
	1000 persons				
Belgium	80.9	14.7	11.4	54.8	55.5
Bulgaria	738.9	197.4	180.1	361.4	187.4
Czech Republic	132.7	16.8	12.8	103.2	115.8
Denmark	80.1	23.8	9.7	46.6	60.3
Germany	749.7	114.8	132.5	502.5	588.0
Estonia	52.3	25.0	7.3	20.0	17.2
Ireland	272.0	64.2	52.5	155.4	79.0
Greece	1 212.7	713.3	211.0	288.5	528.3
Spain	2 227.0	1 472.4	224.1	530.5	724.3
France	1 014.8	240.5	123.2	651.1	698.1
Italy	3 392.7	2 360.3	397.7	634.6	790.9
Cyprus	82.0	63.4	7.9	10.8	14.0
Latvia	181.0	71.5	35.3	74.3	60.1
Lithuania	366.1	156.1	100.6	109.4	109.9
Luxembourg	5.0	0.6	0.7	3.7	2.2
Hungary	1 143.5	612.5	231.2	299.8	151.1
Malta	18.5	12.7	2.7	3.2	1.6
Netherlands	211.6	41.7	32.4	137.6	227.9
Austria	346.3	165.3	65.2	115.8	202.5
Poland	3 802.6	1 518.3	667.0	1 617.4	1 977.3
Portugal	708.1	286.1	135.2	286.8	511.1
Romania	7 156.9	5 169.0	1 303.3	684.7	2 725.8
Slovenia	208.5	109.2	40.1	59.3	81.7
Slovakia	91.0	25.9	13.0	52.1	56.3
Finland	125.3	54.7	19.2	51.5	84.1
Sweden	141.5	80.2	20.2	41.2	63.8
United Kingdom	418.5	141.9	50.6	226.1	318.9
EU-27	24 960.4	13 752.0	4 086.3	7 122.1	10 433.0

Who is working in agriculture?

Very quick structural changes

- Millions of farm employments were lost since 2000
- New migratory movements (from inside & outside the UE)
- New status of employment (e.g. Posted workers)



Source: Eurostat, LFS (online data codes: lfsa_egan22d).

2000-2012 changes

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Diversity of status

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- On the other hand, the Farm Structure Survey (FSS) indicates that 25 million people were regularly engaged in farm work in the EU during 2010 (including part time activity).

Head of the farm (pers)	11 999 340
Family labour (pers)	11 836 180
Regular employees (pers)	2 035 120
Non regular employees (AWU)	769 280
Non employed by the farm (AWU)	15 080

→lack of data for several millions of casual workers and people non employed by the farm

- agriculture = sector with high level of forced work (ILO 2014) and illegal employment

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- Specialized farmers (farm activity as main source of income)
- Regular farm workers (one or several farms) (may have their own small scale farm)
- Irregular farm workers (one or several farms, one or several country) (may have their own scale farm)
- People working on the farm but employed by an other organisation (posted workers, service activities e.g. chemical treatments in livestock facilities, etc.)

Guidelines

- Diversity of working situations in agriculture
- Potential exposure to pesticides
- So many regulations…

Potential exposures to pesticides

“ Pesticides “ =

- Crop protection products (phytopharmaceutical = herbicides, fungicides, insecticides)

+

- Biocides

+

- Certain veterinary drugs (e.g. external insecticides for cattle, sheep used in dips, sprayers…)

Potential exposures to pesticides

Regarding occupational heath, in the EU, it is more dangerous to work in agriculture than in army (Eurostat)

Exposure to pesticides is considered to be a major source of hazard in agriculture

Health effects are described in various fields (cancer, neurodegenerative diseases, metabolic diseases, reproduction…) (Inserm, 2013, etc.)

Potential exposures

Pesticides as an unknown source of health hazards for farm labour:

Risk assessment is focussed on certain part of the activity :

- Crop protection products
- Preparation of the mixture, spaying and cleaning of the sprayer

Risk assessment is made for one product

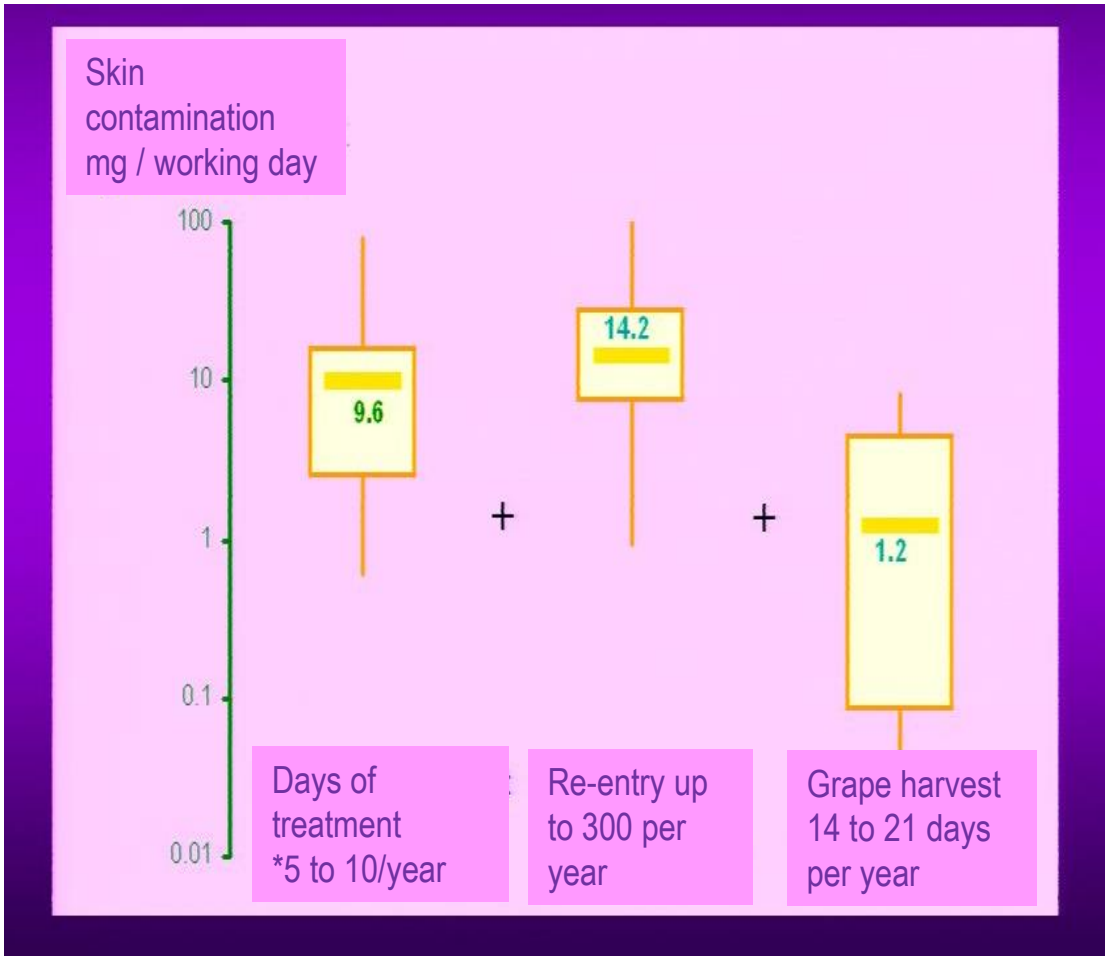
Potential exposures

Pesticides as an unknown source of health hazards for farm labour : the example of re-entry in vineyards

Source Lebailly, Baldi, et al. 2009. Pestexpo

Potential exposures

Pesticides as an unknown source of health hazards for farm labour: the example of re-entry, vineyards



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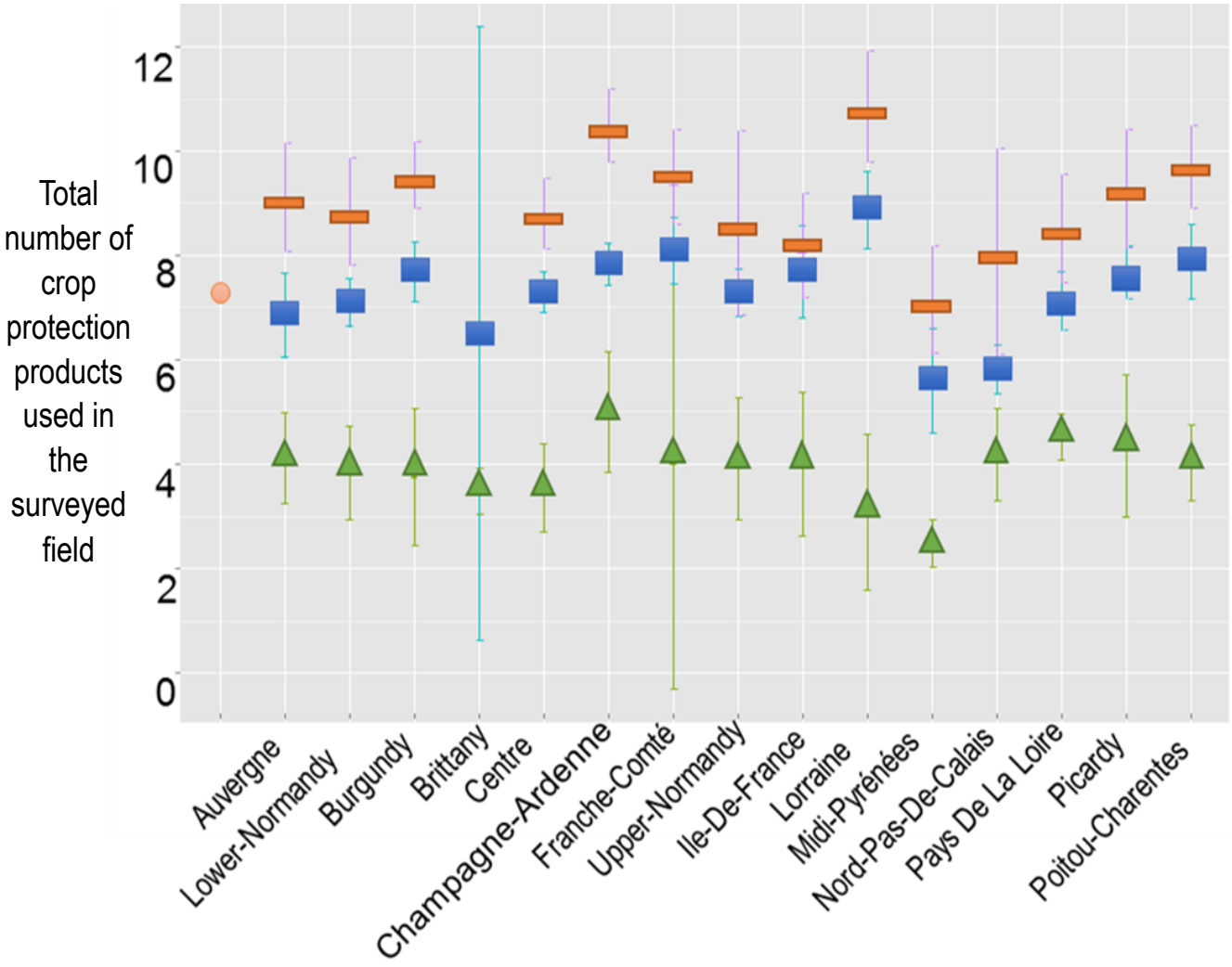
Combined exposures : one field

number of products for one crop (rapeseed) in one field during for one campaign



Intensive & low tillage
high level of N /ha and treatments, reduced tillage last 5 years.
36,1% ,surveyed fields

Intensive & tillage
(high level of N /ha and treatments high level tillage last 5 years.
47,9% surveyed fields

Less intensive
(lower level of N /ha and lower number of treatments.
31,6% surveyed fields.

Whole sample.

Source: Agreste 2011, Survey on farm practices. Special data processing Anses 2014
Practices are surveyed for a sample of 2101 rapeseed fields, (Laurent et al. 2014)

Combined exposures : one farm

Beyond treatments for one production: besides combined treatments for each field in one production, each farm has several productions and this should be considered into exposure scenarios.

Index of the the number of productions that are combined (crops and livestock activities)

	Economic size (Standard product, euros)	All the farms		Farms with rapeseed		Farms with sheep		Farms with fruits and permanent crops	
		nb of productions (73 aggregates) median	nb farms	nb of productions (73 aggregates) median	nb farms	nb of productions (73 aggregates) median	nb farms	nb of productions (73 aggregates) median	nb farms
Small	[0-8000[	2	114 767	2	1083	3	19 329	2	10 720
	[8000-25000[	4	80 404	4	2642	6	9 410	3	10 900
Medium	[25000-100000[	6	156 613	6	19 876	8	18 149	4	15 452
Large	[100000-250000 [	8	114 349	8	33 767	10	7 906	5	8 990
	>ou = 250000	6	48 609	10	15 517	11	1 826	4	4 222
	All farms	5	514 742	7	72 885	6	56 620	3	50 284

(Source Farm Census 2010, special processing). (Aggregation into 73 groups of productions (e.g. all types of vegetable are aggregated); diversification activities are not included) (e.g. wood processing, food processing…). (Laurent et al. 2014)

Combined exposures : one person

EX. salaried worker : shepherd * vineyards (same year)

Vineyards (farms D+E+F)
(spring / automn)

Shepherd (summer, farms A+B+C)

Dips / showers, Foot baths….

Other farm activities (same or other farms)

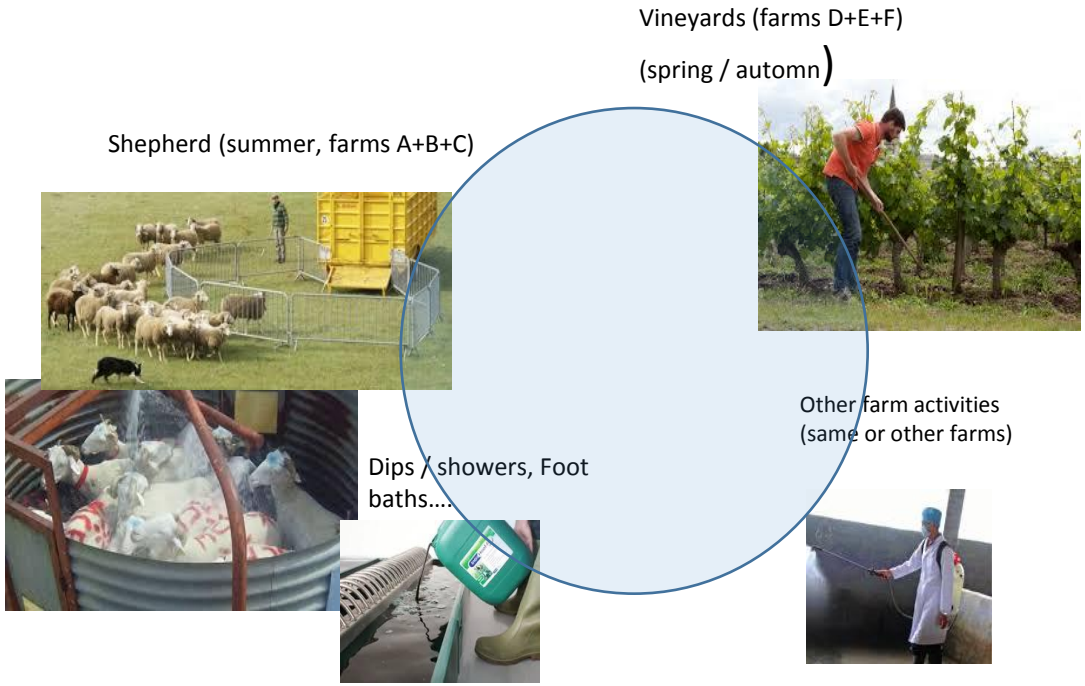
(Laurent, Jas . 2014)

Combined exposures : one person

First solution that is envisaged: Personal Protective Equipements

But

- Do not always provide effective protection
- Are not adapted to the conditions of farm practice and may be dangerous in certain climatic conditions
- Costs are very high in complex systems



Guidelines

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So many regulations….

- Rules and guidelines for MA of crop protection products
- Rules and guidelines for MA of veterinary drugs
- Rules and guidelines for MA of biocides
- Advisory services crop protection products (national application of Dir UE127/2009)
- Advisory services, veterinary drugs (national regulations)
- Animal welfare
- Environmental protection
- Personal equipment protection, different regulation for Crip protection products, for biocide, for veterinary drugs
- Health and security at work for salaried people
- Health and security for non salaried people
- Machinery (sprayers…)
- Local/national regulations regarding allowed and forbidden practices
- Regulations on compulsory training
- Regulations on pesticides residues in the products
- Regulation on occupational diseases / insurance
- … etc.

Fragmentation of the source of information

Fragmented sources of information

- Regulations (EU / national), administrative documents, “technical documents”, quality contracts, advisory tools… Many sources of information (European agencies [EFSA, ECHA, OSHA…], EU administration, national administrations, local authorities, sector-based organisations, supply-chain actors….) (ADE 2009)
- A large proportion of the people working in the farms are not employees : mandatory obligation (for employers and third parties) *versus* occupational safety perceived as a personal issue
- Various types of “advisory services” with little skills and no organised back office

Fragmentation of the source of information Advisory services

- No coordinated scheme in the EU regarding prevention schemes to reduce exposure to pesticides in the EU (intervention of advisory services). No rigorous assessment of existing interventions in the EU while they exist in other countries (US, Latin America) (Laurent 2012, ProAkis 2014,2015)
- e.g. in France, two advisory frameworks for crop protection products:

- MSA (Agricultural social insurance) with prevention advisors and occupational medicine (about 450 people), in charge agriculture in the French system of occupational health

versus

- advisors form economic organizations (about 12000 advisors) (input suppliers, collectors) in charge of advice on safety for the use of crop protection products (regulation derived from EC 128/2009).

→ **Accountability? Independence?**

Prevention rationale

- Regulation of the sales of products: *driven by a marketing rational, ignores the actual conditions of the practice at farm level.* Takes into consideration the impact of the exposure to a single product, ignores combination of products within a class of products (e.g. crop protection) or with several classes (crop protection + biocides + veterinary medicines)
- Often, the only person who can be identified to be responsible for dangerous exposure is the victim of the exposure

Prevention rationale

- Focus on PPE and adaptation of the worker to the danger (“risk perception”, behaviours) rather than on reduction of the danger (pesticide use) and adaptation of the working situations to the worker.

- While agronomic solutions could be developed in order to better control pest population

Accountability, technological trajectories

In theory, it is possible to conceive a system where the risk can be clearly assessed for each substance, for each situation, where the information can be delivered to each individual according to her needs, where… everything will be under control.

In practice, multiplicity of productive situations, increasing complexity of regulations, conflicting interests, lack of resources to produce enough data to follow-up actual exposures and to control the implementation of safety measures…

→ increasing debates on the need for a drastic change of the technological path of agriculture and to decrease drastically the level of pesticides used

Accountability, technological trajectories

DÉSOGERME AGRICHOC - *Gamme désinfectants*

DÉSINFECTANT DE CHOC BACTÉRICIDE, FONGICIDE, VIRUCIDE

- **Très large spectre, élimine bactéries, champignons et virus.**
- **Prophylaxie haute performance des maladies contagieuses (grippe aviaire et porcine, virus aphteux ornithobacterium...).**
- **Homologation du Ministère de l'Agriculture N° 2020286.**
- **Très économique : utilisation globale à 1%.**
- **Testé efficace à 0,25% en 2 heures de contact.**
- **Thermonébulisable.**
- **Parfum léger pin vert.**
- **N° d'inventaire au Ministère de l'environnement : 30674.**

CARACTÉRISTIQUES PHYSICO-CHIMIQUES :

- Liquide vert pâle, incolore avec odeur conifère.
- Ininflammable.
- Densité à 20°C : 1,03 ± 0,02.
- pH de la solution concentrée : 4,5 ± 1,0.
- pH de la solution diluée à 1% : 8 environ.
- Soluble en toutes proportions dans l'eau et les solvants polaires.
- Composition : Chlorure de didecyl dimethyl ammonium 35 g/L, Chlorure d'alkyl dimethyl benzyl ammonium 10 g/L, Formaldehyde 120 g/L et Glutaraldehyde 30 g/L.
- Exempt de composés chlorés, iodés, phénoliques et métaux lourds.
- Compatible avec les composés organiques cationiques et non ioniques.
- Incompatibles avec les composés anioniques, les acides et bases forts.
- Bactéricide à très large spectre : bactéries Gram + et Gram - , mycobactéries... ; Fongicide ; Virucide.
- Conforme aux normes AFNOR de désinfection, bactéricide, fongicide et virucide NFT 72 301, 72 190, 72 180, 72 181 et aux **normes** Européennes **EN** 1276 et 1650.
- Actif en présence d'eau dure et de matières protéiques.
- Irritation primaire cutanée à 5% : non irritant.
- **DESOGERME AGRICHOC** est un biocide utilisé pour l'usage PT 03 (produits biocides destinés à l'hygiène vétérinaire).

SECURITE / ENVIRONNEMENT :

- Homologation N° 2020286 par le Ministère de l'Agriculture.
- Agrément N°00416, prophylaxie des maladies contagieuses (dont fièvre aphteuse).
- Cette préparation, diluée à la dose maximale d'utilisation préscrite, ne fait l'objet d'aucun classement selon la directive 1999/45/CE.
- Corrosif : peut provoquer des brûlures. Contient du formaldéhyde.
- Le port de gants, lunettes et masques de protection est fortement recommandé.
- Eviter de rejeter le produit concentré dans l'environnement (utiliser la totalité aux doses préconisées). Faire retraiter l'emballage par un prestataire agréé.
- Xn : Nocif.
- Utiliser les biocides avec précaution. Avant toute utilisation, lire l'étiquette et les informations concernant le produit.
- Usage réservé aux professionnels.

MODE D'UTILISATION :

- Traitement préliminaire conseillé : désinsectisation, humidification, dépoussièrage, nettoyage des locaux, rinçage à l'eau.
- Appliquer par aspersion, avec machine à pression (ATOMIST) ou par trempage en bacs.
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Doses et usages :

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- Prophylaxie des maladies contagieuses : 1% en 30 min à 20°C.
- Thermonébulisation (bactéricide, fongicide) à 1,5 ml/m³, contact 3 h.
- Testé bactéricide, fongicide, virucide à 0,25%, temps de contact 2h.

LABORATOIRES A.C.I.
Tél : 04 42 94 92 40 - Fax : 04 42 94 16 46 - www.laboratoires-aci.com - contact@laboratoires-aci.com

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Identification	(CE) 1272/2008	67/548/CEE	Nota	%
INDEX: 605-001-00-5 CAS: 50-00-0 EC: 200-001-8 FORMALDEHYDE	GHS06, GHS08, GHS05 Dgr Carc. 2, H351 Acute Tox. 3, H331 Acute Tox. 3, H311 Acute Tox. 3, H301 Skin Corr. 1B, H314 Skin Sens. 1, H317	T Carc. Cat. 3;R40 T;R23/24/25 C;R34 Xi;R43	B D [1] [2]	10 <= x % < 25
CAS: 7173-51-5 EC: 230-525-2 CHLORURE DE DIDECYLDIMETHYLAMMONIUM	GHS07, GHS05, GHS09 Dgr Met. Corr. 1, H290 Acute Tox. 4, H302 Skin Corr. 1B, H314 Aquatic Acute 1, H400 M Acute = 10	C,N C;R34 Xn;R22 N;R50		2.5 <= x % < 10
CAS: 111-30-8 EC: 203-856-5 REACH: 01-2119455549-26 GLUTARAL	GHS06, GHS05, GHS09, GHS08 Dgr Met. Corr. 1, H290 Acute Tox. 3, H301 Skin Corr. 1B, H314 Skin Sens. 1, H317 Acute Tox. 3, H331 Resp. Sens. 1, H334 Aquatic Chronic 2, H411 Aquatic Acute 1, H400 M Acute = 1	T,N T;R23/25 C;R34 Xn;R42/43 N;R50	[1]	2.5 <= x % < 10
CAS: 111-76-2 EC: 203-905-0 REACH: 01-2119475108-36 2-BUTOXYETHANOL	GHS07 Wng Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Acute Tox. 4, H332	Xn Xn;R20/21/22 Xi;R36/38	[1]	0 <= x % < 2.5
CAS: 63449-41-2 EC: 264-151-6 COMPOSÉS DE L'ION AMMONIUM QUATERNAIRE, ALKYL EN C8-18 BENZYL-DIMÉTHYLE, CHLORURES	GHS07, GHS05, GHS09 Dgr Met. Corr. 1, H290 Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Aquatic Acute 1, H400 M Acute = 10	C,N C;R34 Xn;R21/22 N;R50		0 <= x % < 2.5
CAS: 8000-41-7 EC: 232-268-1 REACH: 01-2119553062-49 TERPINEOL	GHS07 Wng Skin Irrit. 2, H315 Eye Irrit. 2, H319	Xi Xi;R36/38		0 <= x % < 2.5
CAS: 8000-41-7 EC: 232-268-1 REACH: 17-2119411205-56-0000 TERPINEOL	GHS07 Wng Skin Sens. 1, H317 Eye Irrit. 2, H319	Xi,N Xi;R41-R43 N;R51/53		0 <= x % < 2.5
CAS: 7785-26-4 EC: 232-077-3 REACH: 05-2114544095-51-0000 L-ALPHA-PINENE	GHS07, GHS09, GHS08, GHS02 Dgr Flam. Liq. 3, H226 Asp. Tox. 1, H304 Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Acute 1, H400 M Acute = 1 Aquatic Chronic 1, H410 M Chronic = 1	Xn,N Xn;R65 Xi;R38-R43 N;R50/53 R10		0 <= x % < 2.5
INDEX: 603-001-00-X CAS: 67-56-1 EC: 200-659-6 REACH: 01-2119433307-44	GHS02, GHS06, GHS08 Dgr Flam. Liq. 2, H225 Acute Tox. 3, H331	T,F T;R23/24/25-R39/23/24/25 F;R11	[1]	0 <= x % < 2.5

Access to relevant information

Farmers are supposed to access information through the internet

However, in France for instance

	Class of economic dimension (Product, euros)	All farms	
		%	nbr
Small	[0-8000[	**14**	16317
	[8000-25000[	**27**	21548
Mediuml	[25000-100000[	**47**	73553
Large	[100000-250000[	**72**	82767
	>ou = 250000	**83**	40704
	Total exploitations	**45**	234889