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10th European Conference on Pesticides
and Related Organic Micropollutants in the Environment

&

16th Symposium on Chemistry and Fate
of Modern Pesticides

joined to

10th MGPR International Symposium of Pesticides in Food
and the Environment in Mediterranean Countries:
CONCERNS, CHALLENGE & POSSIBLE SOLUTIONS



Toxicity, persistence and degradation of pesticides used in greenhouses farming in Ziban, Biskra (Algeria)

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INTRODUCTION

A rapid and sustainable growth of the population is noticed in many parts of the developing world - particularly in Africa, the Middle East and parts of Latin America. The world now is directly affected by the **food crisis**.

Nearly one billion people are already malnourished and 400 million people are chronically undernourished.

Facing this situation, the countries are trying to solve this problem and to ensure a certain **food security** for the population. Therefore, **agricultural sector is the solution**. So, the FAO has developed five principals keys and stressed the need to respect them to obtain a **sustainable food and agriculture balanced and accessible for all**.



Improving efficiency in the use of resources is crucial to sustainable agriculture

Sustainability requires direct action to conserve, protect and enhance natural resources

Sustainable food and agriculture requires responsible and effective governance mechanisms

Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture

Agriculture that fails to protect and improve rural livelihoods, equity and social well-being is unsustainable



Five principles for sustainable food and agriculture (FAO, 2014)

Biskra southern region in Algeria

Produce and supply more than 59% of the national production of primary vegetables (source DSA 2016)

Tomatoes, Chilli Peppers Peppers and Eggplants... etc at prices compatible with consumer incomes



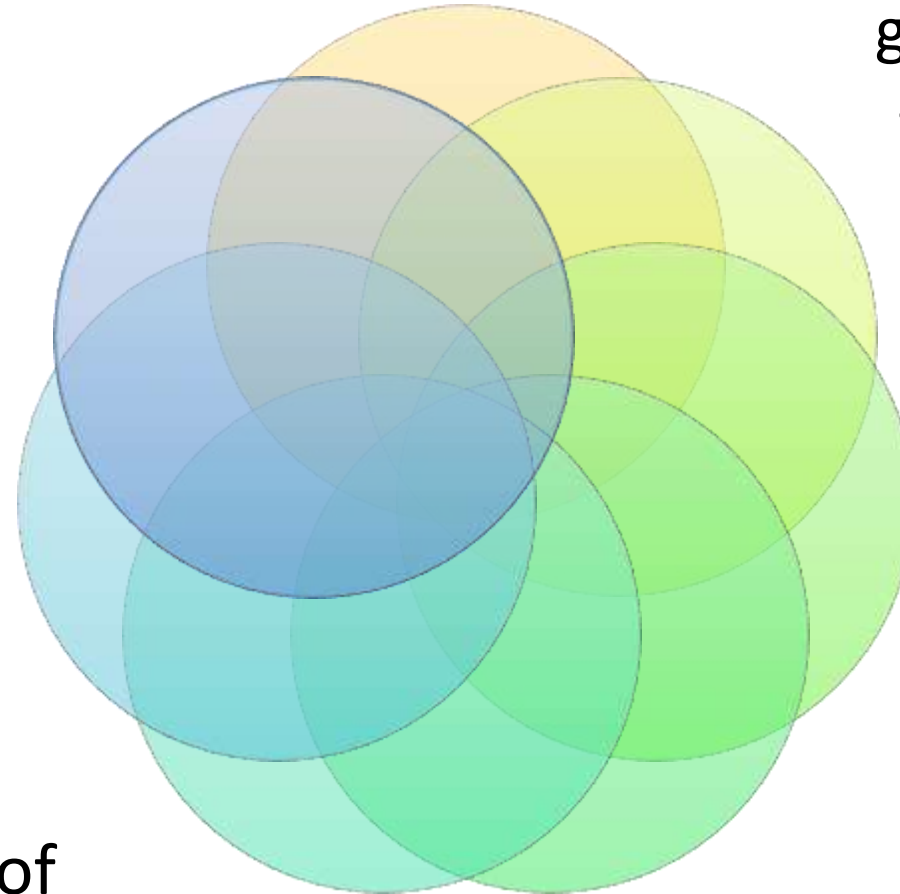
Agricultural programs of the state

3 – 6%

Environmental and health impacts

Farmers Biskra heavily rely on pesticides

1,8% Increase of pesticides usage



Greenhouses

More than 130 000 greenhouse and plus than 5000 HA surface(Source DSA,2016)

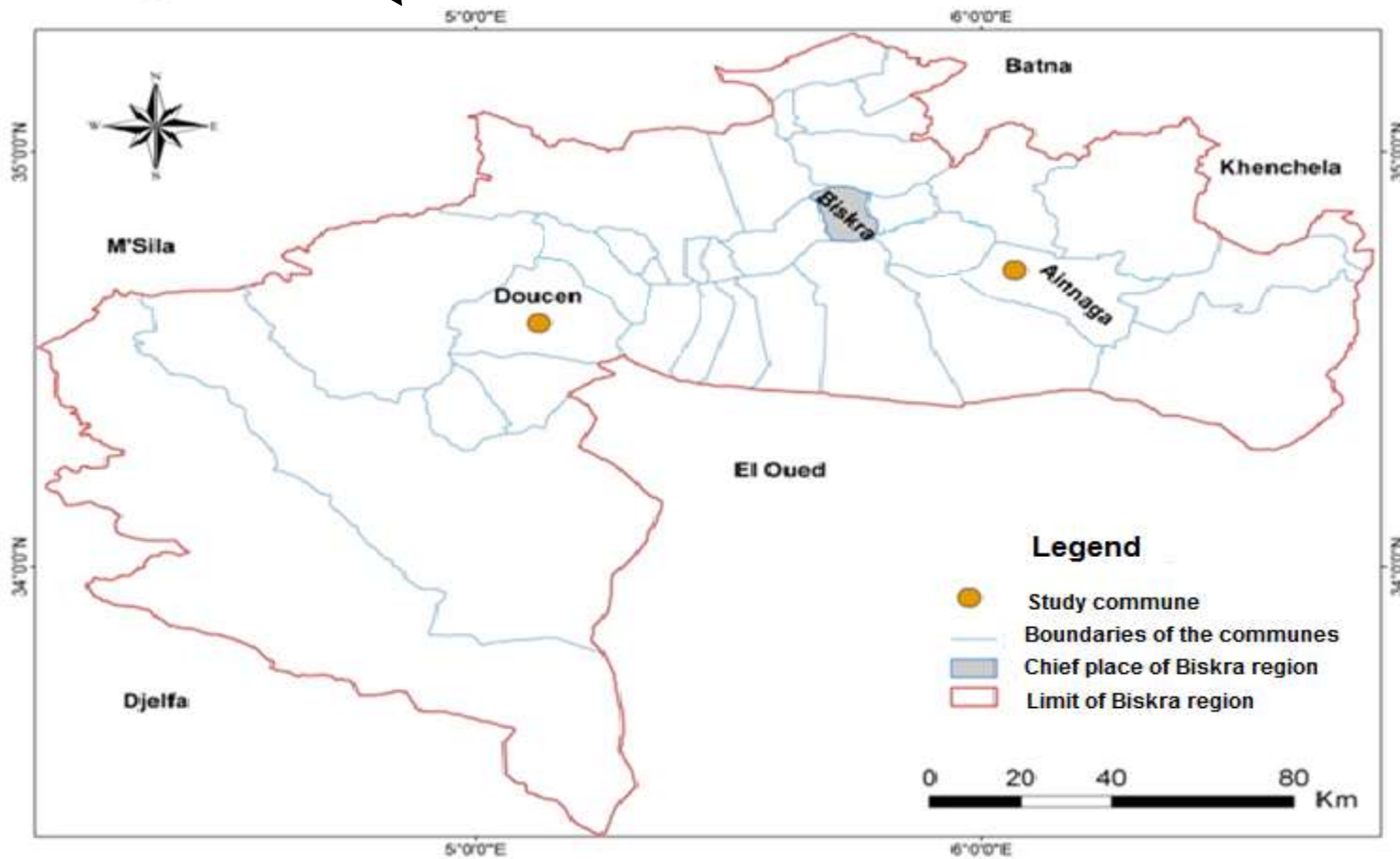
Requires countless of fertilizers and pesticides

1% Increase of agriculture production

What kind of pesticides used by farmers in greenhouse farming system in Ain Naga and Doucen communes of Biskra region?



Materials and Methods



Questionnaires and interviews

- 96 vegetable farmers and 20 phytosanitary sellers.
- Randomly selected in Ain Naga and Doucen).
- During 2016 and 2017.

Treatment of results

- **Pesticide's list** : Using national index of phytosanitary products.
- **Toxicity classes**: Using the WHO recommended classification guideline of 2009
- **The Half-life DT50**: Using PPDB pesticide proprieties and database of pesticide active ingredients (March, 2018).
- Software IBM SPSS statistics 24 + EXCEL (Office 2013).

1. CHEMICAL GROUPS

Results and discussion

Ain Naga

INSECTICIDE 54 %

FUNGICIDE 24 %

HERBICIDE 12 %

ACARICIDE 03 %

BIOPESTICIDE 02 %

FUNGI+
BACTERICIDE 03 %

INSECTI+ACARI
+NEMATICIDE 02 %

Doucen

INSECTICIDE 72 %

FUNGICIDE 20 %

HERBICIDE 01%

ACARICIDE 01%

INSECTI+ FUNGI+
HERBIC+ FUMIGANT
02 %

NEMATICIDE 02 %

RODONTICIDES 02 %

**TOTAL
OF
75**
different
types of
active
ingredients
(AI)



2. CHEMICAL FAMILIES

Ain Naga

- Neonicotinoid
- Avermectin
- Phosphonoglycine
- Pyrethroid
- Triazole
- Carbamate
- Organophosphoré
- Dicarboximide
- Thiocarbamate
- Benzimidazole
- Benzothiazinone
- Carbamate + Organophosphate
- Organophosphate
- Oxazole
- Pyrethroid+ Neonicotinoid
- Triazinone
- Aryloxyphénoxypropionat

- Carboxamide
- Cyclohexanedione
- Diamide anthranilique+Pyrethroid
- Diphenyl ether
- Imidazole + Organophosphate
- Organophosphate + Pyrethroid
- Organostannane
- Oxadiazine
- Phénylamide
- Quinoline
- Tetric acid
- Strobilurin + Triazole

Results and discussion

Doucen

- Avermectin
- Neonicotinoid
- Pyrethroid
- Carbamate
- Triazole
- Organophosphate
- Oxazole
- Neonicotinoid+ Pyrethroid
- Oxadiazine
- Strobilurin
- Carboxamide
- Diamide anthranilique
- Halogenated hydrocarbon
- Indandione anticoagulant
- Dithiocarbamates +Phénylamides
- Strobilurin + Triazole

3. ACTIVES INGREDIENT

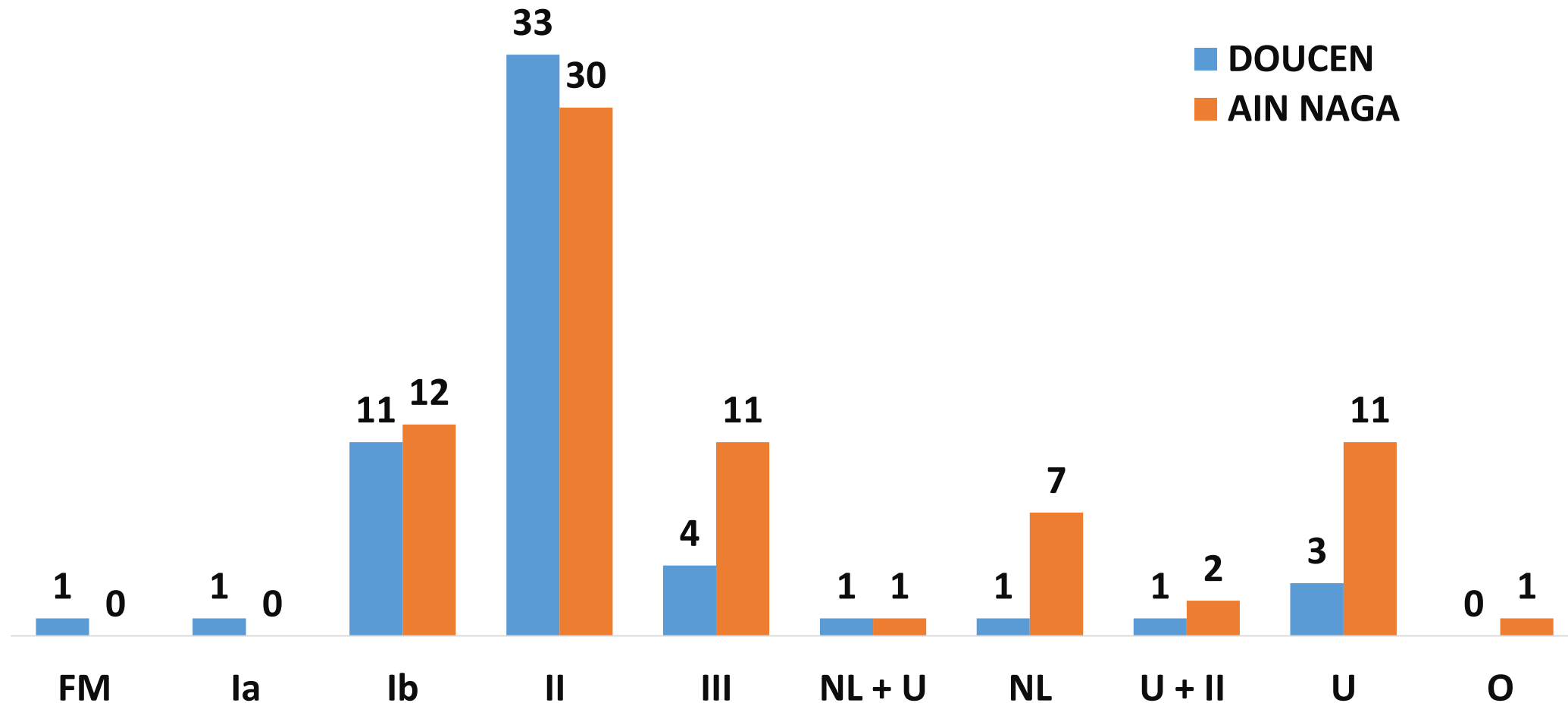
Ain Naga

ABAMECTINE***
 ACETAMIPRIDE**
 CHLORPYRIPHOS –ETHYL*
 IMIDACLOPRIDE*
 IPRDIONE*
 LAMBDA-CYHALOTHRIN*
 MANCOZEBE*
 TRIADIMENOL*
 BENTAZONE
 CYPERMETHRINE
 EMAMECTIN BENZOATE
 HYMEXAZOLE
 METRIBUZINE
 OXAMYL
 PENCONAZOLE
 PROPAMOCARBE +FOSETYL-ALUMINIUM
 THIOPHANATE-METHYL
 ALPHA CYPERMETHRINE
 AZOXYSTROBINE + DIFENOCONAZOLE
 CHLORANTRANILIPROLE + LAMBDA -
 CYHALOTHRINE
 CHLORPYRIPHOS
 CHLORPYRIPHOS +CYPERMETHRINE

CYCLOXYDIM
 DAZOMET
 FENAMIDONE + FOSTYL-ALUMINIUM
 FENBUTATIN OXYDE
 FLUAZIFOP-BUTYL
 FOSETYL -ALUMINIUM
 GLYPHOSATE
 HEXYTHIAZOX
 INDOXACARBE
 IPROVALICARBE + OXYCHLORURE DE
 CUIVRE
 METALAXYL M
 METIRAM ZINC
 OXYFLUORFENE
 8-Hydroxyquinoline sulfate(chinosol)
 SOUFRE
 SPIROMESIFEN
 TAU - FLUVALINATE
 Thiaclopride + Deltamethrine
 THIAMETHOXAM
 Thiamethoxam + Lambda-cyhalothrine
 2-NAPHTHYLOXY ACETIC ACID
 THIOCYCLAM HYDROGEN OXALAT

- ABAMECTINE***
- ACETAMIPRIDE***
- CYPERMETHRINE**
- DIAZINON*
- HYMEXAZOLE*
- ACETAMIPRIDE +CYPERMETHRINE
- CHLORANTRANILIPROLE
- HEXACONAZOLE
- INDOXACARBE
- MANCOZEBE
- THIACLOPRIDE
- TRIADIMENOL
- TRIFLOXYSTROBINE
- 1,3-DICHLOROPROPEN
- AZOXYSTROBINE +DIFENOCONAZOLE
- CHLOROPHACINONE 0,005% GR
- DAZOMET
- DELTAMETHRINE
- EMAMECTIN BENZOATE
- HEXITHIASOX
- MANEBE 80%
- METALAXYL+MANCOZEBE
- METRIBUZINE
- THIOCYCLAM HYDROGEN OXALATE
- Thiaclopride + Deltamethrine
- 2-NAPHTHYLOXY ACETIC ACID

Results and discussion



4. Classification of active ingredients recorded regarding their toxicity in both areas.(WHO, 2009)

Ia="extremely hazardous", Ib="highly hazardous", II="moderately hazardous", III="slightly hazardous", U="unlikely to present acute hazard", O="obsolete", FM="fumigant", NL="not listed".

DOUCEN

PERSISTENCE IN SOIL DT50

Non-persistent

54

Moderately persistent

02

Persistent

05

DEGRADATION SPEED IN WATER DT50

Moderately fast 46

Stable 03

Fast 03

Slow 04

AIN NAGA

PERSISTENCE IN SOIL DT50

Non-persistent

42

Moderately persistent

17

Persistent

06

DEGRADATION SPEED IN WATER DT50

Moderately fast 32

Stable 16

Fast 06

Slow 02

5. Persistence in soil DT50 and degradation speed in water DT50, of pesticides recorded the most used in the study areas, using the PPDB, 2018.

Conclusions

- ❑ The phytosanitary sellers are generally influencing the farmers choice of pesticides.
- ❑ Majority Farmers are heavily depending on pesticides in the two areas.
- ❑ Toxicity classes II and Ib are most employed even considered very dangerous.
- ❑ Non-persistent and Moderately persistent pesticides are frequently recommended by sellers and used by farmers.

In summation, serious health and environmental problems may occur. However, blames are usually laid on pesticides without considering the way the pesticides are applied. Therefore, the situation in the two areas is not clear or diffidently precise, and to better understanding, farmers behaviour, use and the application of these pesticides should be assess in future.



Thank You

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