

# IPM in Japan focusing biocontrol

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## Major Registered Microbial Pesticides from Japan as of September, 2016 (T.Wada)

Company	Product	AI	Target
Idemitsu Kosan	Tough Block WP	<b><i>Talaromyces flavus</i></b>	Anthrachnose, Colletotrichum, Botrytis, Rice Bacterial seedling blight and grain rot
Central Glass	Biokeeper WP	<b><i>Erwinia carotovora</i></b>	Bacterial soft rot in Potato and vegetables (avirulent strain)
Central Glass	Vegekeeper WP	<b><i>Pseudomonas fluorescence</i></b>	<i>Pseudomonas chicorii</i> , <i>Xanthomonas campestris</i>
Kumiai Chemical	EcoHope	<b><i>Trichoderma atroviridae</i></b>	Rice ; Bacterial seedling blight, Bacterial grain rot
Hybrid pesticides from Kumiai	Clean Cup	<b><i>B.subtilus</i> D747 + Copper hydroxide 50%</b>	leaf mold, Botrytis, downy mildew, Corynespora, Pseudoperonospora

Nippon Soda	Masterpiece WP	<b><i>Pseudomonas rhodesiae</i>. HAI-0804</b>	Citrus, peach, plum ; Xanthomonas campestris, Pseudomonas syringae
Arysta Japan	Pirates	<b><i>Metarhizium anisopliae</i></b>	Aphids, Thrips, Whitefly
Sumitomo	Gottu A EC	<b><i>Paecilomyces tenuipes</i></b>	Vegetables: Whitefly, Bemisia, Aphids
Various	Btk/ Bta	<b>Various over 10 strains</b>	Lepidoptera B.cereus scandal 20 years ago but cleared.
Idemitsu Kosan	BioLisa	<b><i>Beauveria brongniartii</i></b>	Long horn beetle etc
Arysta Japan	Botanigard	<b><i>Beauveria bassiana</i></b>	Aphids, Thrips, Whitefly, Lepi
Arysta Japan	Mycotal	<b><i>Lecanicillium muscarium</i></b>	whitefly, Aphids
Mitsui & Co.	Preferred	<b><i>Isaria fumosorosea</i></b>	whitefly
SDS Biotech	Impression clear	<b><i>B.amyloliquefaciens</i></b>	Botrytis, powdery mildew
Various	Various	<b><i>B.subtilus</i></b>	Botrytis, powdery mildew
Meiji	Lactoguard	<b><i>Lactobacillus plantarum</i></b>	Soft rot
Arysta Japan	Hamaki Tenteki	<b><i>GV Homona magnanima/ Adoxophyes orana</i></b>	Tea leaf roller , Tea tortorix
Nihon Nohyaku	Bacterose	<b><i>Agrobacterium radiobacter</i></b>	Rose Agrobacterium tumefaciencie

But in fact, these biopesticides sales are very

small and sluggish...日本の生物農薬は法律により防除暦  
に使用を必須にしないと増加しないであろう。

Why?

Because growers choose chemical pesticides...

In case of emergency, we have to rely on  
chemicals...

Need governmental pressure to include  
biopesticides into spray calendar...

compulsory...

# Natural Enemy : Mass production

## 天敵の大量増殖について

天敵昆虫の大量増殖技術

スイス、ドイツ、アメリカ、カナダ、イギリス、オランダなどで活発であった。  
1970年代～

ソ連、中国も共産主義体制下で大量増殖していたが、その内容は公表されておらず、信頼性は高くはない。

天敵昆虫は日本でも増殖されていた。（各地の試験場、武田薬品農薬部門、など）  
現在も小規模に沖縄の会社などで生産されている（農水省のコミバ工増殖もあり）  
天敵昆虫の生産のポイントは 増殖コスト と 市場の存在

増殖することはできるがビジネスとして維持するのは困難。

オランダ、ベルギーの生産量が多く、日本で増殖しても価格競争にならない。

上記2カ国以外で増殖ビジネスに成功しているのは、イスラエル、ケニヤや委託増殖のモロッコなど。 バラの栽培

# 日本でも増殖は可能だが。。。

1990年当時 日本からの輸出超過で、輸入促進が叫ばれていた。（現在のトランプ大統領の主張と通ずる）

日本の研究者は天敵昆虫を増殖していたが、  
欧米からの輸入に賛成。

天敵は農薬取締法により規制されていた。世界で随一の国。

マルハナバチは小池百合子環境大臣より外来動物に指定。

# Natural enemies of Japanese Origin from Japanese companies 日本発の天敵昆虫群

Natural enemy	Target	Producer
<b>Predators</b>		
<i>Propylea japonica</i> (Lady bug)	wider range of Aphids	Sumitomo Techno
<i>Franklinothrips vespiformis</i>	thrips	Arysta Japan
<i>Haplothrips brevitubus</i>	thrips	Ishihara
<i>Gymnaeaeus liturivorus</i>	thrips	Agri-soken
<b>Parasites</b>		
<i>Aphelinus asychis</i>	Aphids	Sumika Techno
<i>Neochrysocharis formosa</i>	leafminers	Sumitomo
<i>Aphidius gifuensis</i>	Aulacorthum solani	Arysta Japan



# Biopesticide and Natural enemies Registration system of Japan 生物農薬の登録要件

Japan is unique country to require registration even for Natural enemies.

1. Import permission (non-phytophagus, non-human infecting microbials)
2. Data Requirement : over 3year field or greenhouse efficacy trials over 8 valid results for each pest insects and crops  
Very official strict trials. No compromise by neutral governmental research stations.
3. Total year till registration : approx. 5 years. But 1 year after submission (pre submission period is longer)
4. Microbial pesticides : Over 10 valid efficacy result over 3 years for each pest and crops. Registration 1 year after submission rule.
5. Pathogenicity studies of approx. 5 routes required. Similar to US EPA.



To obtain registration in Japan or elsewhere,  
(要求された試験を実施するほうが早く登録が取れる)

It is (seems) quicker to conduct all the required studies and trials than negotiating (refuting) with authorities.

Chemical pesticide companies are facing more and more

(I used to be in charge of chemical pesticide registration in Japan.)

stringent requirement from authorities....especially in US and EU and probably in Japan too...

Moreover, Regulation makes the product quality better.....規制があるほうが品質がアップする。

Without stringent regulation, lower quality products will prevail...(even though the law seems RED TAPE requirement)

So the reasonable regulation and registration system of Biopesticides are good to the Industry!!!

(If not well regulated, number of natural enemies or conidia in a bottle are not regulated and sometimes lower than the indicated nos.)

This prevents influx of low quality products to EU, US and others....

If there is no strong Intellectual property protection like Patents, who will invest to such fragile business sector? (特許がないと保護されない生物農薬)

Stringent and Strict Registration requirement is good for quality and safety and the last IP protection way.

Of course, slow process is not welcome !

# Current Japanese IPM (日本は化学農薬でも先進国)

Japan is No. 4 or 5 Chemical pesticide Market in the world.

No. of Patents and inventions in chemical pesticide in Japan is after Germany, Switzerland and U.S.A.

95% of control is done by Chemical pesticides as of today.

But much of strawberry and sweet pepper in greenhouses are protected by IPM method.

Difference in natural enemy use pattern in Japan from European standards.  
(mainly on Macrobiales)

That is : Zero release and RESET method due to high insect pressure..

# Why chemical correction before release is necessary in Japan or warmer regions?

Japan is temperate zone country....

日本は害虫密度がヨーロッパより高い！

But the summer in Japan, sometimes.....

Bangkok or Hong Kong is cooler!!!

So the insect pressure is mostly very high from March thru October....

Similar to Italy and Spain...

# Compatible chemicals in IPM

## 天敵と一緒に使いやすい農薬

Thrips	Pleo*, Match, Cascade
Aphids	Urara**, Chess, Colt (Nihon Nohyaku)
Spider mites	Starmite***, Danisaraba(OAT), Blfenazate, Kanemite(Agro Kanesho)
Lepidopteran	BT, Flubendiamid(Nihon), Rynaxiypyr
Pentamidae, whitefly	Dinotefuran(Mitsui), Colt, Nitenpyram
<b>Many of less toxic chemicals to natural enemies are coming from Japanese manufacturers.</b>	

\*Pyridalyl (Sumitomo) \*\* Flonicamid (Ishihara), \*\*\*Cyenopyrafen(Nissan)

Before introduction (7-30days)

使える農薬 天敵放飼前

Ardent, Pyrethroids, Agrimec, Milbemycine,  
Kotetsu, **Movento**, Spinosad, Diana et cetra

Should be avoided after natural enemy entry.

**But even after** natural enemy and microbial  
plant protection method are well established,  
in Japan..... If new chemicals registered ....?



Movento insecticide or Agrimek insecticide are registered recently in Japan,

効果の高い化学農薬が出現すれば農家は？

- ▶ Some growers returned to old chemical based spray calendar!
- ▶ Growers are not loyal to BC and not using BC for environment or nature, but for efficacy reason!  
Such as resistant pesticides inundation!

Even though, important points in global IPM Progress  
ソフトな化学農薬とのコラボが重要

Collaboration program with **soft chemicals** , which means selective, and  
“Environmentally sound“ (less and less toxic to environment).

Now more than **50% of Pesticides market** is Herbicide segment.

More product registration in natural enemies and microbials.  
However, **Herbicides arena and outdoor crop such as grain and orchards** is key to dominate the PPP market. Otherwise, most of chemical co. do not care.. And will not change....their directions...

# Japan BioControl Association born this year.

2 Biological control associations have existed for the past 20 years. Members are ;

**Arysta Japan**

**Idemitsu Kosan**

**SDS Biotech**

**Kyoyu Agri**

**Shin-Etsu Chemical**

**Sumitomo Chemical**

**Central Glass**

**and other over 20 associated members and individual members**

Thanks for your help and Good luck to Biocontrol future/Avenir !!!