Introduction of Organic Liquid Foliar Fertilizer

“ORGAMIN”

Contents
1. What is ORGAMIN ?
2. Feature
3. Analysis with HPLC
4. How to apply
5. Expected effect
6. Effect of ORGAMIN DA
7. Summary of effect
ORGAMIN is an organic liquid foliar fertilizer, extracted from fermentation metabolite.

ORGAMIN is rich with amino acids.
Extract of fermentation metabolite

The main component of the fermentation metabolite of molasses, soybean, wheat and fish meat etc. is amino acid, which is safe for human body and environment.

The metabolite also contains enzymes, nucleic-acid from DNA and vitamins.

The enzymes activates the fermentation.

Amino acid

Protein is an important component of cell of plants and amino acid is the basic building block of the proteins.

Spraying amino acid to leaves promote growth of plants.

Our goal

To help farmers, To increase their income by producing “High Quality Agricultural Products” and “Increase yield”.
3. Analysis with HPLC

22 types amino acids are found in the extract
4. How to apply

Application of ORGAMIN by spray machine (wheat)

Application of ORGAMIN by radio controlled helicopter (soybean)
Can be sprayed w/ portable sprayer for small scale plot.
Efficient way of application
## 5. Expected effect

<table>
<thead>
<tr>
<th>Crop Group</th>
<th>Apprication Timing</th>
<th>Doses(L/ha)</th>
<th>Expected Effect or observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tomato, Bell Pepper, Chili Pepper, Egg Plant, Cucumber, Green Pea, Strawberry</td>
<td>① Seeding, ② 1st bloom, ③-⑥ 7-10days intervals</td>
<td>ORGAMIN: 3.0-4.0, 3.0, 3.0; ORGAMIN DA: 2.0-3.0</td>
<td>Longer harvest</td>
</tr>
<tr>
<td>Peach, Pear, Apple, Nectalin, Cherry, Grape, Plune</td>
<td>① Bloom, ② 2weeks after ①, ③-④ 2-3weeks intervals</td>
<td>ORGAMIN: 3.0, 3.0, 3.0; ORGAMIN DA: 2.5</td>
<td>High Brix, Larger fruits, Less loss for falling fruits</td>
</tr>
<tr>
<td>Sugar cane</td>
<td>① 90day after cutting or replant</td>
<td>ORGAMIN: 5.0; ORGAMIN DA: 4.0</td>
<td></td>
</tr>
<tr>
<td>Rice (Transplant)</td>
<td>① Seeding bed, ② Ramification, ③ Sprouting, ④ Earning bloom</td>
<td>ORGAMIN: 4.0×water dilut, 4.0×water dilut; ORGAMIN DA: 2.5-3.0</td>
<td></td>
</tr>
<tr>
<td>Rice (Direct seed), Wheat</td>
<td>① Ramification, ② Sprouting, ③ Earning bloom</td>
<td>ORGAMIN: 4.0, 4.0, 4.0; ORGAMIN DA: 2.5-3.0</td>
<td></td>
</tr>
<tr>
<td>Cotton, Soybean, Irish Potato</td>
<td>① 3-4leaves stage, ②-⑤ 2weeks intervals</td>
<td>ORGAMIN: 4.0-5.0, 4.0-5.0; ORGAMIN DA: 2.5-3.0</td>
<td>Yield increase, High growth Rate, Resistance to disease</td>
</tr>
<tr>
<td>Corn</td>
<td>① 30 days after planting, ②-④ 2weeks intervals</td>
<td>ORGAMIN: 4.0-5.0, 4.0-5.0; ORGAMIN DA: 3.0</td>
<td></td>
</tr>
</tbody>
</table>
6. ORGAMIN DA, Instruction for Coffee

a) Application timing
1. Prepare ORGAMIN DA spray solution by diluting 1,000 times w/ water.
2. Before bloom, apply 1st spray of diluted ORGAMIN to foliar.
3. 1~2 weeks after bloom, apply another spray of diluted ORGAMIN to foliar.
4. W/ 3~4 weeks interval, apply two sprays in each interval to foliar.
5. Total 4~5 times of sprays to foliar are sufficient.

b) Dose
2.5~3L/ha

c) Expected effects
• Even yearly production
• Uniform maturation
• Early commercial production
1. ORGAMIN application improved size / color of coffee beans.

2. ORGAMIN also reduced berry drop and significantly increased yield by ~15% in average.

3. 2.5L/ha of dosage of ORGAMIN* was sufficient.

* Concentration of “ORGAMIN” is 1/2 of “ORGAMIN DA”. “ORGAMIN” is an older version of “ORGAMIN DA”.
### 6. Effect of ORGAMIN* (Coffee, Results in Vietnam)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Young fruits drop/%</th>
<th>Green bean yield /MT/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 month after flowering</td>
<td>10 month after flowering</td>
</tr>
<tr>
<td></td>
<td>Best</td>
<td>Good</td>
</tr>
<tr>
<td>ORGAMIN 5.0L/ha</td>
<td>3.8</td>
<td>4.2</td>
</tr>
<tr>
<td>ORGAMIN 2.5L/ha</td>
<td>4.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Control</td>
<td>8.3</td>
<td>10.8</td>
</tr>
</tbody>
</table>

† Level of farming management

<table>
<thead>
<tr>
<th>Formula of fertilizer</th>
<th>test area /ha</th>
<th>Dose/kg/ha</th>
<th>note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best</td>
<td>1.2</td>
<td>400 100 100</td>
<td>+Organic manuare (coffee husk 50m³/2years)</td>
</tr>
<tr>
<td>Good</td>
<td>1.2</td>
<td>300 85 300</td>
<td></td>
</tr>
<tr>
<td>Fairly good</td>
<td>1.2</td>
<td>300 85 300</td>
<td></td>
</tr>
</tbody>
</table>

* Concentration of “ORGAMIN” is 1/2 of “ORGAMIN DA”.
“ORGAMIN” is an older version of “ORGAMIN DA”.
This photo shows that ORGAMIN treated coffee trees can extend new shoots vigorously while carrying fruits on the 2nd year branches. Almost the same amount of production of the coffee beans could be expected in the next year for this tree. Normally, a coffee tree carrying fruits in the year does not extend the vigorous new shoots without ORGAMIN treatment. Therefore production is limited in the next year. This photo was taken at Minas Gerais, Brazil.
6. ORGAMIN DA, Instruction for Oil Palm

a) Application condition
1. Prepare ORGAMIN DA spraying solution by diluting 80 ~ 100 times w/ water.
2. Spray this diluted solution to palm trees once a month by sprayers.
3. Sprayers were set so that the dosage is to be as described below assuming actual planting density.

b) Dose
1L/ha

c) Expected effect
Increasing FFB yield
6. Effect of ORGAMIN DA (For Oil Palm in Malaysia)

38% FFB yield improvement on mineral soil by monthly spraying (Dosage 1L for 1ha)
ORGAMIN DA, Instruction for Cotton

a) Application timing
1. Prepare ORGAMIN DA solution by diluting 1,000 times w/ water.
2. At 3-4 leaves stage, give 1st spray of diluted ORGAMIN to foliar.
3. Give additional 4 sprays in 2 weeks interval to foliar.
4. Total 5 times of sprays to foliar are sufficient.

b) Dose
4L/ha

c) Expected effects
• Increasing harvest amount
• Speeding up the process to harvest
• Improving quality of fiber (length, gloss)
• Reducing population of red leaf mice
Cotton fiber from treated plot has **better gloss** and **longer in length**. Farmer can sell in **5% higher price** according to a cotton buyer of India. Time to harvest: 80 – 90 days normally -> **15 – 20 days** shorten after spraying

Test area: Madhya Pradesh, India 1Ac (4000m²)
Date: 30th Sept 2014, after 4th spray
Variety: ANKUR 216
6. Effect of ORGAMIN DA (Cotton, Results in India)

Stem height is much higher in treated plot. Note that the same person appears in both photos.

Test area: Madhya Pradesh, India 1Ac (4000m²)
Date: 30th Sept 2014, after 4th spray
6. Effect of ORGAMIN DA (Cotton, Results in India)

<table>
<thead>
<tr>
<th>condition</th>
<th>sample No.</th>
<th>number of bulbs</th>
<th>number of flowers</th>
<th>bulb + flower</th>
<th>stem height/cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>treated</td>
<td>1</td>
<td>25</td>
<td>22</td>
<td>47</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>27</td>
<td>22</td>
<td>49</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>22</td>
<td>27</td>
<td>49</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>74</td>
<td>71</td>
<td>145</td>
<td>-</td>
</tr>
<tr>
<td>control</td>
<td>1</td>
<td>19</td>
<td>5</td>
<td>24</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>19</td>
<td>15</td>
<td>34</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>30</td>
<td>6</td>
<td>36</td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>total</td>
<td>68</td>
<td>26</td>
<td>94</td>
<td>-</td>
</tr>
</tbody>
</table>

54% increase for number of bulbs + flowers
The farmer expected 40% more of harvest

Test area: Madhya Pradesh, India 1Ac (4000m²)
Date: 30th Sept 2014, after 4th spray
### 6. Effect of ORGAMIN DA (Cotton, other area)

<table>
<thead>
<tr>
<th>region</th>
<th>country</th>
<th>test period</th>
<th>treatment</th>
<th>Yield /kg ha⁻¹</th>
<th>improvement rate/%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MinasGerais</td>
<td>Brasil</td>
<td>Aug-85</td>
<td>8.0L/ha x 3 times</td>
<td>2814</td>
<td>114</td>
</tr>
<tr>
<td>Parana</td>
<td>Brasil</td>
<td>Aug-83</td>
<td>6.0L/ha x 6 times</td>
<td>2313</td>
<td>114</td>
</tr>
<tr>
<td>Parana</td>
<td>Brasil</td>
<td>Sep-86</td>
<td>4.25L/ha x 5 times</td>
<td>2655</td>
<td>130</td>
</tr>
<tr>
<td>Goias</td>
<td>Brasil</td>
<td>1987</td>
<td>6.0L/ha x 4 times</td>
<td>1625</td>
<td>118</td>
</tr>
<tr>
<td>Parana</td>
<td>Brasil</td>
<td>1987</td>
<td>5L/ha x 6 times</td>
<td>3769</td>
<td>116</td>
</tr>
<tr>
<td>Sao Paulo</td>
<td>Brasil</td>
<td>1987</td>
<td>2~4.1L/ha x 5 times</td>
<td>2950</td>
<td>118</td>
</tr>
<tr>
<td>CA</td>
<td>USA</td>
<td>Jun-98</td>
<td>1.87L/ha x 4 times</td>
<td>1183</td>
<td>125</td>
</tr>
<tr>
<td>Xinjiang</td>
<td>China</td>
<td>2011</td>
<td>1.2L/ha x 5 times</td>
<td>5275</td>
<td>132</td>
</tr>
</tbody>
</table>

10～30% of yield increase is typical
Other qualitative effects of ORGAMIN for Cotton

1. Faster growth of root systems
2. Better plant structure, size and uniformity
3. Better fructifying
4. Longer crop life duration
5. Heavier ball weight
6. Effect of ORGAMIN DA (for Litchi and Durian)

Photo 1  Lychee in Taiwan
Left side is treated, right side is control.
Left side lychee grew larger, and had better color.

Photo 2  Durian in Philippines
This Durian has **NOT** flowered for long time.
Soon after ORGAMIN was sprayed, it started flowering and fruiting again due to better nutrient balance.
6. ORGAMIN DA, Instruction for Potato

a) Application timing
1. Prepare ORGAMIN solution by diluting 1,000 times w/ water.
2. At 3~4 leaves stage, give 1\textsuperscript{st} spray of diluted ORGAMIN to foliar.
3. W/ 14 days interval, give one spray of diluted ORGAMIN in each interval to foliar.
4. Total 5 times of sprays to foliar are sufficient.

b) Dose
800mL/Ac (2L/ha)

c) Expected effect
\begin{itemize}
\item Increasing amount of harvesting
\item Resist better against diseases and the effect continues for long time
\end{itemize}
Test area: Aungban, Myanmar
Crops name: potato
Planted date: 2nd Feb 2014
ORGAMIN Spray: 1st Spray 16th Mar 2014, 14days interval, 6times.
Test area: 0.02Ac (140m²)
Harvesting date: 10th May 2014

The yield of potato was doubled based on average year regardess bad climate condition in the testing period.
12,500kg/Ac(≒4,000m²)
### 6. Effect of ORGAMIN DA (Potato, Results in Myanmar)

<table>
<thead>
<tr>
<th>Plant 1</th>
<th>Plant 2</th>
<th>Plant 3</th>
<th>Plant 4</th>
<th>Plant 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty: 4</td>
<td>Qty: 6</td>
<td>Qty: 8</td>
<td>Qty: 9</td>
<td>Qty: 9</td>
</tr>
<tr>
<td>Weight: 0.30 vs</td>
<td>Weight: 0.50 vs</td>
<td>Weight: 0.30 vs</td>
<td>Weight: 0.30 vs</td>
<td>Weight: 0.30 vs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Plant 1 (ORGAMIN DA Treatment)</th>
<th>Plant 2 (ORGAMIN DA Treatment)</th>
<th>Plant 3 (ORGAMIN DA Treatment)</th>
<th>Plant 4 (ORGAMIN DA Treatment)</th>
<th>Plant 5 (ORGAMIN DA Treatment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qty: 22</td>
<td>Qty: 12</td>
<td>Qty: 18</td>
<td>Qty: 16</td>
<td>Qty: 12</td>
</tr>
<tr>
<td>Weight: 0.90 vs</td>
<td>Weight: 0.50 vs</td>
<td>Weight: 0.75 vs</td>
<td>Weight: 0.75 vs</td>
<td>Weight: 0.50 vs</td>
</tr>
</tbody>
</table>

**Upper photo**: control  
**Harvest**: 2.84kg/5 plants  
**Double yields**

**Lower photo**: treated  
**Harvest**: 5.68kg/5 plants
The number and amount of pods were excellent in treated area.

The each pod was large and it tasted better.

Test area: Kita Gunma-gun Yoshioka Urushihara (Japan Carlit vinyl house test)
Crops name: Green Soybeans
Planted date: 19th July 1988
Test area: 1m × 10m (Cultivation density 60cm × 35cm)
Harvesting date: 26th September 1988
ORGAMIN Treated date:
1st: 3th August 1988 (true leaf 3~4 : 400times)
2nd: 23th August 1988 (Mixed w/ Lannate after flowers: × 400 dilution)
### 6. Effect of ORGAMIN (Green Soybeans, Results in Japan)

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Total</th>
<th>Ratio (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>treated</td>
<td>111</td>
<td>111</td>
<td>81</td>
<td>88</td>
<td>112</td>
<td>504 g</td>
<td>116</td>
</tr>
<tr>
<td>untreated</td>
<td>73</td>
<td>97</td>
<td>86</td>
<td>91</td>
<td>88</td>
<td>436 g</td>
<td>100</td>
</tr>
</tbody>
</table>

Harvest amount increased up to **15%**
6. Effect of ORGAMIN (Lettuce, Results in Japan)

Test area: AKITA agricultural test area
Crops name: Lettuce
Planted date: 1th April 1988      Transplant date: 11th April 1988
Permanent plant date: 5th May 1988      Test area: 1m × 20m (154 loafs/area)
Harvesting date: 4th July 1988
Harvest amount increased up to 48%, size of the loaf was more uniform (treated 75.3kg/106loaf, control 50.8kg/69loaf)
6. ORGAMIN DA, Instruction for Garlic

a) Application timing
1. Prepare ORGAMIN DA solution by diluting 1,000 times w/ water.
2. At 2-3 leaves stage, give 1st spray of diluted ORGAMIN to foliar.
3. At 5-6 leaves stage, give another spray of diluted ORGAMIN to foliar.
4. W/ 14 days interval, give one spray in each interval to foliar.
5. Total 6 times of sprays to foliar are sufficient.

b) Dose
520mL/Ac (1.3L/ha)

c) Expected effect
- Increasing harvest amount
- Size of garlics will be bigger
6. Effect of ORGAMIN DA (Garlic, Results in Myanmar)

Test area: Aungban, Myanmar
Planted date: Nov, 2013
ORGAMIN Spray: 1st Spray 10th Dec 2013, 14days interval, 7times.
Test area: 0.2Ac (800m²)
Harvesting date: End of Mar, 2014

The garlic treated by ORGAMIN DA was bigger.
The garlic were sold with better price in market.
Approx. 1.5times higher price
6. Effect of ORGAMIN DA (For Garlic and Loquat)

Photo 1  Garlic in Japan
Left side: control, Right side: treated
Garlics in right were grown better with bigger size and stronger stalks.

Photo 2  Loquat in Sichuan, China
Left side: control, Right side treated
Treated loquat was larger and more matured.
It was treated 5 times in every 7~10 days after transplant. Root spreading was better in the treated area. These were grown at Japan Carlit R&D center, Gumma JAPAN.
7. Summary of effect

• Increase yield

• Increase chlorophyll density in leaves

• Increase resistance to pests

• Increase resistance to extreme weather conditions, such as abnormal high/low temperature, high/low air or soil humidity

• Accelerate growth of root system

• Increase sugar content
Thank you for your attention!

Carlit Singapore Pte., Ltd.

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