Brio organic inspection and farming
what we are doing and our experience with carrot production in Sicily
Brio S.p.A. is a producer and a treader of products only from organic farming.

It has been established in 1993 and belong to Cooperativa La Primavera, a cooperativa of only organic farmers situated in Verona.
Brio sales markets

- Austria
- Danimarca
- Finlandia
- Francia
- Germania
- Gran Bretagna
- Grecia
- Olanda
- Polonia
- Repubblica Ceca
- Spagna
- Svezia
- Svizzera
The general aim of the Inspection System is to ensure that all farms comply to the organic regulations so that
- all farmers operate in the market with the same rules
  so that
- consumers are assured that they are buying products that come from trustworthy and compliant organic farms
• Brio inspection is based on:
  – FARM LEVEL:
    – checking the compliance of organic farming for each product.
  – SUPPLIER LEVEL:
    • relationship between farmers and supplier
    • control of the exact import of goods from each farm
    • checking no products come from “ghost supplier”
What is our experience?

– some cultivations are more difficult than others, especially in some areas and seasons

– Each cultivation in organic farming experiences a problematic phase, due to:
  • weed competition, fungi and pests, weather condition

In addition, Brio check if the organic nitrogen input is enough for the expected yield
What is a critical period for organic cultivation?

*Not allowed microdosis are possible*

Correct timing for organic inspection and correct matrix for analysis (i.e. soil or leaves)
<table>
<thead>
<tr>
<th>Culture</th>
<th>Potential risk</th>
<th>Samples Timing (critical period)</th>
<th>Matrix</th>
<th>Chemicals to find</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetables transplanted in open fields</td>
<td>weeds</td>
<td>30 d from trasplanting</td>
<td>soil under the row (5 cm depth)</td>
<td>P.a. diserbanti, fra cui Glifosate, Diquat, Paraquat, Glufosinate ammonio, Linuron e metaboliti</td>
</tr>
<tr>
<td></td>
<td>earth insect</td>
<td></td>
<td></td>
<td>P.a. geodisinfestanti (Clorpirifos, Teflurin, Etoprofos, Oxamil, Fenamifos, Cadusafos)</td>
</tr>
<tr>
<td>Carrot (i.e. sowing cultivation)</td>
<td>weeds</td>
<td>30-40 d after sowing, (3-4 true leaves), preferably soil sampled in humid area</td>
<td>soil under the row (5 cm depth)</td>
<td>Metribuzin, Prometrina, Linuron e metaboliti, Pendimetalin, Aclonifen, Clomazone, Diquat, Paraquat, Glifosate</td>
</tr>
<tr>
<td></td>
<td>nematods and earth insect</td>
<td></td>
<td></td>
<td>Geodisinfestanti, Carbammati, organofosforati (Teflurin, Clorpirifos, ecc.), Fenamifos</td>
</tr>
<tr>
<td></td>
<td>weeds</td>
<td>50-40 d before harvesting</td>
<td>leaves</td>
<td>Clomazone, prometrina, fluazifop, linuron and metabolite</td>
</tr>
<tr>
<td>Pears</td>
<td>and fungi (alternaria)</td>
<td>half june</td>
<td>leaves</td>
<td>P.a. insetticidi e fungicidi, fra cui: Fenoxicarb, regolatori di crescita, ditiocarbammati, Fenazaquin, Imidaclorpid</td>
</tr>
<tr>
<td>Table grape</td>
<td>thrips and fungi (botrytis, early blight)</td>
<td>grape at pea size</td>
<td>leaves</td>
<td>insettificidi e fungicidi, fra cui: piretroidi indoxicarb, flufenoxuron, acrinatrina, lufenuron</td>
</tr>
<tr>
<td></td>
<td>mite, fungi</td>
<td>summer (pre harvest)</td>
<td>leaves</td>
<td>Bromopropilato, fenazaquin, Procimidone, strobilurine, fenexamide, pirimetanil, ciprodinil, fludioxonil</td>
</tr>
<tr>
<td></td>
<td>botrytis</td>
<td>after autumn rains</td>
<td>leaves</td>
<td>Cimoxalin, fosetil alluminio e fosfati (search ac. Fosforoso) (metod. Det. Metaboliti Fosetil AI), Vinclozolin e altri</td>
</tr>
</tbody>
</table>
## Brio control system: analysis and residual output

<table>
<thead>
<tr>
<th></th>
<th>Nº analyses</th>
<th>2008 (al 01/09/08)</th>
<th>2007</th>
<th>2008 (al 01/09/08)</th>
<th>2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samples in field</td>
<td>110</td>
<td>246</td>
<td>15</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Samples of final products in Brio warehouse</td>
<td>151</td>
<td>242</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>261</td>
<td>488</td>
<td>18</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>
Often in South Italy, the Packers buy the products directly on the fields and will harvest the products themselves, having already paid the farmers.

The quantity harvested is “coincidentally” the same as the quantity demanded.

- E.g., packer make claim he has harvested 12 tons when in fact he has harvested 8 and the other 4 tons have been secretly supplied by “ghost producers/fields”

- Orange, Lemon, potato, carrots, clementine, table grapes and some vegetables in Pulia and Campania.
• Brio compares the yield of each farmer, registered with the packer, with the actual physical size of the farm.

• At random, Brio goes directly to the fields during pre-harvest period and makes a prediction of the number of tons that will be harvested. This predicted yield is compared to the final harvested yield, claimed by the packer.

  • Orange, tomato, table grape, potato

We discovered strange net yield:

- lemons 60 tons/ha
- new potatoes 40 tons/ha
- carrots 60 tons/ha
• Sicily has been the main centre for the growing of conventional carrots for many years.

• Currently the market demand for conventional carrot covers only one month out of a potential three months.

Several conventional carrot growers have now changed over to organic methods.

The surface area involved is more than 250 hectares.

BRIO has undertaken and managed its own carrot production in Sicily in a rented farm during 2006 and 2007.
• In Sicily weed management in carrots is more difficult than northern European areas; cultivation starts in autumn and ends in spring
  
  – weeds come out from autumn till spring continuously, in several botanic family depending on soil temperature fluctuation
    
    • E.g.: graminacee come out in winter even after flaming treatment
    • E.g.: Caucaulis daucoides, a weed similar as carrot, come out only after autumn

  – Weeds grow faster than carrot, especially in winter
• And so:
  – Many weeds and specially graminaceae come out even after flaming treatment and before you can do the first weeding/hoeing
  – Carrot grows slowly and foliage remain very small so that first hoeing can cause earth to cover the young plants (=DEATH)
    - Therefore first hoeing can not be so close to the row of carrots
How organic Sicilian farmers grow their carrot?

• Sicilian farmers sow carrots in two or three closely spaced rows in the ridge or in the flat

No hoeing is possible between the double rows

SO THERE

Weed control only by hand is possible!
How organic carrots are grown by Sicilian farmers

Example of three double rows on the flat
We have tested double row and single row

Hand weeding is less expensive with single row

The university of Pisa tested an area of about 250-350 h/ha of single row carrots by hand weeding in a spring cultivation in Centre of Italy.
STRATEGIA PER IL CONTROLLO FISICO DELLE INFESTANTI SU CAROTA IN SICILIA

Our technical choice
Our technical choice

• Flat raised bed for sowing
  – Because in this way is possible to make a stale seedbed technique

• 2 times stale seedbed technique

Rotating rolls harrow, patented by Univ. Pisa
Our technical choice
Our technical choice

- Sowing 5 single rows 20 cm apart
- Flame treatment before carrot emergence
- 3 precision hoeings

- Only with single rows is possible to hoeing as close as possible
Weed problems

Graminaceae came out even after flaming treatment

It is not possible to hoeing so close to the row as you wish
Weed problems

Some weeds look like carrot:
You can not even pick them by hand!
Hand weeding, how much does it cost in Sicily?
Weeds: a double cost

hand weeding cost (€/ha) and yield/ha (tons)
Selling prices vs cost

BIO and NO-BIO Production costs in comparison to organic carrot price (2006 and 2007)

€/kg

<table>
<thead>
<tr>
<th>Bio</th>
<th>Appraisal false bio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic carrot price (big bag)</td>
<td>0.6</td>
</tr>
<tr>
<td>BIO</td>
<td>0.5</td>
</tr>
<tr>
<td>NO-BIO</td>
<td>0.4</td>
</tr>
</tbody>
</table>

www.briospa.com
Selling prices vs cost

Organic carrot price

Comparison bio vs not bio carrot organic cost in 10 kg box
• Carrot market prices during the two years were under the production costs

• Market price was lowered by bigger Sicilian producers who offered lower prices because of their lower production cost!

• Unfair competition?
What do organic farmers/consumers need?

- An effective control system to prevent fraud, as the current system is not fraud proof

  together with

- Prices market which covers production costs, otherwise “ethical” producers suffer!
Thanks for your attention!

Ivano Soave
BRIO Agronomist
i_soave@brospa.com
www.briospa.com
How BRIO and customers could ensure all the food organic chain?

- Discuss with the farmers the production costs
- Plan organic productions with a fixed price together with customers
- Decide technical organic guidelines that farmers have to follow strictly.
- Check the production during the critical periods and estimate the final yield.