

**PRESENT SITUATION**

One of the problems associated with nuts is the infestations that forces to maintain the goods on cold storage, not for killing the insect just to dispaue it.

Additional in conventional product, producers fumigate the goods, but this operation is not allowed in Organic or Ecologic Products.

In any case, fumigation doesn't avoid to proliferate new pests if the goods are stored in normal conditions.

**IMPROVEMENTS**

CRISOLAR can supply a new concept of packaging: MAP based on CO2 enhanced in vaccum for packs from 10 to 2200 lb.



25 lbs bags



25 kg bag



Partial view of 25 lb box on the pallet  
(bag in box, individual cover)  
84 boxes per pallet



Partial view of 25 lb box on the pallet  
(bag in box, layer cover)



2200 lb Big Bag



2200 lb Big Bag

## EFFECTS ON PRODUCT

- No organoleptical modifications of the taste.
- Just one hour for aerate the product.
- No insects after 42 days of incubation

Ref. N°	Start test	original test	Vacumising till (millibar)	CO2 flushing till (millibar)	Date of ventilation	Exposure time (days)	Second check (date)	Incubation time (days)	Live insects ?
<b>Short time exposure tests</b>									
CR001	9-6-2014	"Pallet 1"	450	900	18-6-2014	9	26-7-2014	38	YES
CR002	10-6-2014	"Pallet 1"	450	726	18-6-2014	8	26-7-2014	38	YES
CR003	12-6-2014	"Pallet 2"	500	816	18-6-2014	6	26-7-2014	38	YES
<b>Long time exposure tests</b>									
CR004	11-6-2014	"pallet 4"	500	800	26-7-2014	45	26-7-2014	0	NO
CR005	11-6-2014	"pallet 4"	500	800	26-7-2014	45	2-8-2014	7	NO
CR006	11-6-2014	"pallet 4"	500	800	26-7-2014	45	9-8-2014	14	NO
CR007	11-6-2014	"pallet 4"	500	800	26-7-2014	45	23-8-2014	28	NO
CR008	11-6-2014	"pallet 4"	500	800	26-7-2014	45	6-9-2014	42	NO
CR009	11-6-2014	"pallet 5"	500	821	26-7-2014	45	26-7-2014	0	NO
CR010	11-6-2014	"pallet 5"	500	821	26-7-2014	45	2-8-2014	7	NO
CR011	11-6-2014	"pallet 5"	500	821	26-7-2014	45	9-8-2014	14	NO
CR012	11-6-2014	"pallet 5"	500	821	26-7-2014	45	23-8-2014	28	NO
CR013	11-6-2014	"pallet 5"	500	821	26-7-2014	45	6-9-2014	42	NO
CR014	11-6-2014	"pallet 6"	500	821	26-7-2014	45	26-7-2014	0	NO
CR015	11-6-2014	"pallet 6"	500	821	26-7-2014	45	2-8-2014	7	NO
CR016	11-6-2014	"pallet 6"	500	821	26-7-2014	45	9-8-2014	14	NO
CR017	11-6-2014	"pallet 6"	500	821	26-7-2014	45	23-8-2014	28	NO
CR018	11-6-2014	"pallet 6"	500	821	26-7-2014	45	6-9-2014	42	NO

Conclusions for these tests :

- Exposure times of less than 10 days didn't give a complete kill.
- An exposure time of 1,5 months gave 100 % kill, with one flushing of carbon dioxide.
- Even after 42 days of incubation, after opening and sampling of the bags, no live insects could be detected in the samples.

## STORAGE OF GOODS

Just normal conditions, as hig is the environmental temperature, quick is the insect killing effect.