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Current situation of pomegranate growing (*Punica granatum* L.) in southern Alicante. Chemical control of pests and diseases and financial cost

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SUMMARY – The pomegranate (*Punica granatum* L.) is one of the crops in the south of the province of Alicante, where imperfections in the rind caused by pests and diseases are the cause of important economic losses for the producer. The solution to physiopathological fruit damage is still unsolved, whereas pest and disease control is practically mastered as a result of the research carried out by the plant health industry and application of compounds. These compounds, if used appropriately, allow us to keep a good control of plant health problems at a reasonable cost. The present work attempts to revise briefly the present plant health problems (pests, diseases and alterations) which frequently affect the pomegranate in the south of Alicante. The costs of pest control are described and analysed as well as their percentage of the total crop costs. The active material most often used is reported and an analysis is made of the altered fruit as a percentage of the total fruit harvested.

Key words: Alterations, pests, pesticides, costs.

RESUME – *"Situation actuelle de la culture du grenadier (*Punica granatum *L.) dans le Sud d'Alicante. Contrôle chimique des ravageurs et maladies et coût financier". La grenade (*Punica granatum *L.) est l'une des cultures du sud de la province d'Alicante, où des imperfections de l'écorce causées par des ravageurs et des maladies sont la cause d'importantes pertes économiques pour le producteur. La solution aux dommages physiopathologiques du fruit n'est pas encore trouvée, tandis que la lutte contre les ravageurs et maladies est pratiquement maîtrisée comme résultat des recherches menées par l'industrie phytosanitaire et l'application de produits. Ces produits, s'ils sont utilisés de façon adéquate, nous permettent de bien maîtriser les problèmes phytosanitaires à un coût raisonnable. Le présent travail vise à réviser brièvement les présents problèmes phytosanitaires (ravageurs, maladies et altérations) qui affectent fréquemment le grenadier dans le sud d'Alicante. Les coûts de la lutte contre les ravageurs sont décrits et analysés ainsi que leur pourcentage dans les coûts totaux de la culture. La matière active la plus souvent utilisée est indiquée et une analyse est faite pour les fruits altérés en pourcentage des fruits totaux récoltés.*

Mots-clés : *Altérations, ravageurs, pesticides, coûts.*

Revision of the crop problems

A revision is made of the pests, diseases and alterations described as such in the pomegranate crop and ranked by order of importance of the damage caused to the crop.

Pests

Aphids

Aphis punicae - "Yellow-green aphid"
Aphis gossypii - "Black aphid"
Aphis fabae - "Black bean aphid"

Scale insects

Planococcus citri, Risso - Root mealy bug
Saissetia oleae, Olivier - "Mediterranean black scale"
Ceroplastes sinensis, del Guer

Lepidopterae

Cryptoblabes gnidiella, Milliere - "Borer"
Myelois ceratoniae, Zell - "Orange worm"
Zeuzera pyrina L. - "Wood leopard moth"

Dipterae

Ceratitis capitata, Wied - "Fruit fly"

Mites

Tenuipalpus punicae, Pritchard and Baker - "Red mite"
Eriophyes granati, Canestrini - Leaf-roller"
Lorrya formosa, Cooreman

Nematodes

Meloidogyne spp.
Helicotylenchus spp.
Xiphinema spp.

Diseases

Phytopthora spp.
Alternaria
Clasterosporium carpophilum A.
Capnodium - "Sooty fungus"

Disturbances or alterations

Cracking
Sun damage
Stem rot
Scratching of fruit by branches
Dry branches

Once the main plant health problems of the pomegranate have been revised, we can go on to discuss the facts of plant health today, its importance and its costs.

Pests

Today the pomegranate crop has basically been treated against two pests that cause harm in shoots and in fruit.

The aphids, *Aphis gossypii* and *Aphis punicae* and the pests *Planococcus* and *Cryptoblabes*. In aphids, the number of annual applications varies from one to three per year, the most normal treatment being of two treatments per year against these pests in adult plantations. The application times fall between the second fortnight in April (1st application, phenological state – D – 1st buds) and the first fortnight in May (2nd application, phenological state F,G – open flowers and fruit set).

Treatments against *Planococcus citri* and *Cryptoblabes gnidiella* were made during 1998 during the first fortnight of July and before releasing the *Planococcus* predator *Crytolaemus montrouzieri*.

These activities of plant health control and the control of reappearance and weeds with post-emergence herbicides that are not residual and not selective are the only treatments that are applied

to the pomegranate in the south of our province, apart from some winter applications or treatments in phenological stage B.

In recent years *Aphis gossypii* has appeared in the pomegranate, generating rapid resistance to insecticides, thus changing the scenario of active material to be used if we wish to carry out a good control of the main pomegranate pest. Active matter such as methyl-oxidemeton, primicarto, thiometon, etc. have given way lately to other more active molecules.

The list of molecules, concentration doses and economic costs for the control of aphid species that affect the pomegranate is included in Table 1. The distribution of insecticide products according to the market quota is shown in Fig. 1.

Table 1. List of molecules, concentration doses and economic costs for the control of aphic species

Active matter	% concentration	Dosis HL	Price cost (ptas/HL)
Benfuracarb	20	200	600
Methomyl	20	150 – 250	165 – 275
Endosulfan	35	150 – 300	135 – 370
Dimethoate	40	100 – 150	60 – 90
Trans-Fluvanilate	24	20 – 30	258 – 384
Propoxur	50	100 – 200	350 – 700

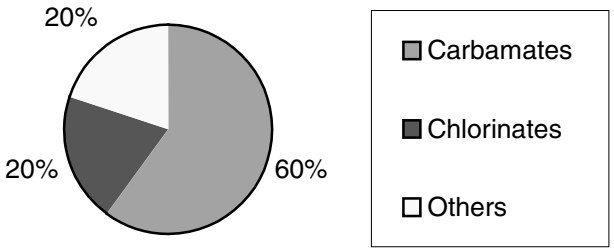

Fig. 1. Aphid control in pomegranates. Distribution of insecticide products according to the market quota.

In order to control *Planococcus* and *Cryptoblabes*, the active matter used, concentration, doses and economic costs are shown in Table 2. Their control using insecticides in chemical groups is shown in Fig. 2.

Table 2. Active matter used, concentration doses and economic costs for the control of *Planococcus* and *Cryptoblabes*

Active matter	% concentration	Dosis HL	Price cost (ptas/HL)
Chlorpyrifos	48	150 – 200	300 – 400
Methidation	40	100 – 150	240 – 360
Diazinon	60	80 – 120	128 – 192
Chlorpyrifos-Methyl	50	150 – 200	
Pirimiphos-Methyl	50	250	

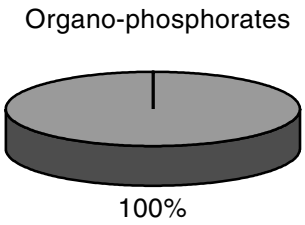

Fig. 2. *Planococcus* and *Cryptoblabes* control using insecticides in chemical groups.

Planococcus and *Cryptoblabes* control is dominated by the group of organophosphorate insecticides (they act on the nervous system of the insects, inhibiting cholinesterase).

The economic cost of plant health products in pomegranate crops varies from year to year, but ranges between 8-13% considering labour.

Taking as a base the study carried out by Y. Costa (pers. comm.) of the SAT AURORA of Albatera on an analysis of crop costs with two cultivars (Mollar and Valenciana) we can observe in Fig. 3 the percentage spent on plant health out of the total expenditure on the crop.

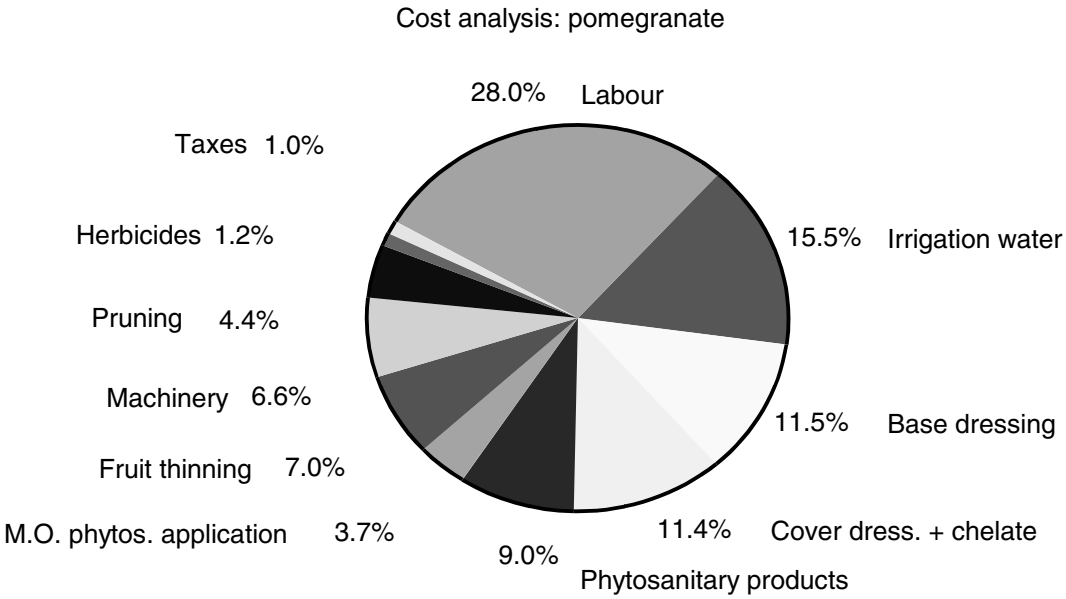

Fig. 3. Total expenditure on plant health in relation to the total expenditure on the crop.

We can therefore observe that the plant health products represent, together with labour for their application and the herbicides used in 13.89% of this estate, the general average is 10-11%.

The distribution of chemical control of pests and spontaneous growth can be represented in percentage form as shown in Fig. 4.

Physiopathological damage

As described previously, the pomegranate pests are kept under control by using the appropriate chemical means. The large problem that is as yet unresolved is the physiopathological damage to the fruit and which causes the greatest commercial and quality losses in harvested fruit.

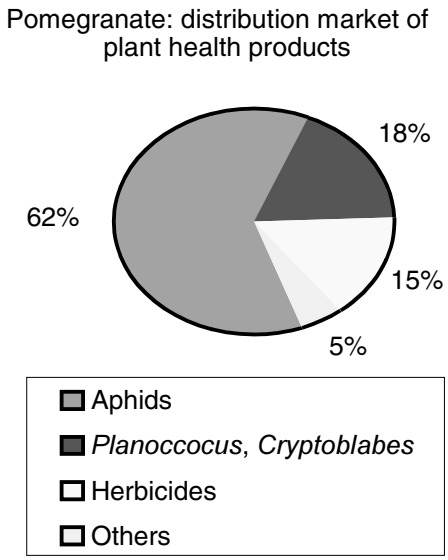

Fig. 4. Distribution market of pomegranate plant health products.

Of all the alterations, two are particularly serious:

(i) Cracking of the fruit, according to the year. This is typical of the crop and caused by lack of water or nutritional balance, and can harm between 8 and 10% of the fruit on the tree, which is never harvested.

(ii) Sun damage, caused by sunlight intensity and a strong transpiration of the rind of the fruit. This varies from year to year and in a normal year can cause damage in between 3-4% even though during this season (1998), damage rose to 6-8%.

Stem scab consists of a suberification of the bark around the peduncle (like Lorrya attacks), lately appearing more frequently.

This data is what we could observe in the field, however if we were to analyse the fruit when it enters storage for handling and packing, this is when the real problems of the crop become apparent.

Based on the data facilitated by Y. Costa of the SAT AURORA of Albatera in the quality controls (176 controls) carried out during the 1997 season when fruit enters storage, the conclusion is that the damage of the fruit harvested and affected by genuine plant health problems (aphids, *Planococcus* and *Cryptoblabes*) rises to 8.6% of all the fruit harvested, whereas alterations of the rind (peduncular scab and sun damage) reach about 30%. This data does not include cracked fruit which, of course, is not harvested.

Conclusions

Once the present plant health situation of the pomegranate crop has been revised, as well as the chemical control applied and the economic costs that are situated at around 10-11% of total expenditure on the crop, the firmest conclusion is that the greatest economic, productive and quality damage is caused by alterations of the fruit or rind. Therefore, in the future, the lines of research to be followed – if drawn up – should work towards solving these serious problems in as much as they affect pomegranate production.

Further reading

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