Below is the abstract for symposium nr 506, abstract nr 46:

Title:
Transformation of tradicional walnut orchard into more productive structures

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Abstract body text:
To show the increase of the productive potential of Chandler Walnut orchards by changing the nutrition concept, increasing the irrigation rate and transforming the tree into a more productive structure with new pruning techniques was the focus of this study. We began to work in 2010 with orchards in full production in the area of Uco Valley, Mendoza, Argentina. Orchards from 10 to 23 years of age planted at 7 x 7 meters (204 plants per hectare). The tree training was diverse, from vase in the eldest orchards to central leader in the newest. The soil was very heterogeneous, rocky, sandy, clayey and loam. The rootstock ranged from *Juglans regia*, *Paradox* and *Juglans hindssi*. The first two years the irrigation system was the traditional one, then we change to drip irrigation system with 4 sides. We started this process with 44 nitrogen units nutrition, 16 of phosphorus, 30 units of potassium and 2 units of magnesium per hectare in orchards in full production by repeating this type of fertilization for two consecutive years. Yields with this type of fertilization were among the 2500 and 4500 kg per hectare depending on the orchard with the variables previously mentioned. The tree training was very heterogeneous, orchards with central leader training in most cases had more than one leader or for some reason the leader was then cut it out. Where we had homogeneous orchards were in those with vase tree training. In the third year, we began to fertilize per tonne of long-awaited Walnut per hectare. This fertilization program was based on the amount of nutrients the plant would use for each ton of nuts produced. The yield increased to 3,500 kg per hectare and to 5,500 kg per hectare in the orchards with the best soil and climate conditions. We keep doing the traditional pruning in orchards with vase training and start with a plan for homogenize the orchards with central leader tree training. This type of fertilization and pruning management plan was made for two seasons in a
row, without observing from one season to the other a significant increase in kg. From the year 2015, we began taking into account not only the nutritional requirement of the fruit but also the nutritional and energy expenditure of the plant as a whole. And also we start a transformation in orchards with vase tree training into a sling system, the same concept was used in the ones that had a central leader training. That is how from that season onwards the units of nitrogen and potassium were substantially increased mainly to meet the requirements of the plant as a whole and in some cases also of the soil, that and the transformation of tree structure into a more productive model, give as a result substantial increases of the inshell walnut production.

Keywords:
Nutrition, increase, production, inshell, walnut, pruning