TELONE™

Soil Fumigant

MANAGING REPLANT PROBLEM & NEMATODES

STARTS WITH A SHANK

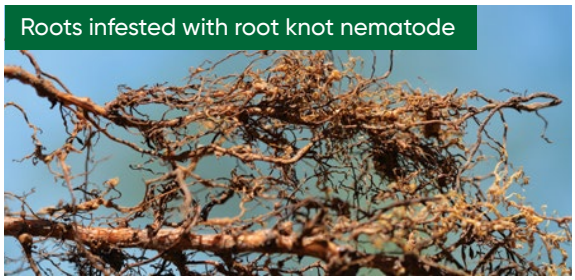
TELEOS AG™

SOLUTIONS

You depend on new plantings to provide decades of productivity. Considering the massive undertaking and expense of planting a new orchard or vineyard, soil fumigation is strongly advised because **THERE IS NO COMING BACK FROM A POOR START.**

NEMATODES AND THE REPLANT PROBLEM

The replant problem, also called replant disease, is the unfortunate result of planting trees and vines into soils where nematodes and soil-borne diseases are present. Tree nuts/fruits planted immediately after tree nuts/fruits commonly experience this problem. Grapes planted after tree nuts/fruits also experience the replant problem.


Roots infested with root knot nematode

The replant problem is caused by nematodes and a complex of soil diseases, not all of which are known. Orchards and vineyards suffering from the replant problem show poor growth and poor vigor, often for the entire life of the crop. As root and vegetative growth suffers, so do yields. Using rootstock with nematode and/or disease resistance will not completely stop the problem as no single rootstock is resistant to all species of nematode. In some cases, nematodes can make the plant more susceptible to diseases, such as bacterial canker, or directly transmit pathogens, such as grape fanleaf virus.

WHY FUMIGATION IS IMPORTANT

The components of the replant problem – nematodes and pathogenic soil organisms – are found throughout the soil profile and extend several feet deep, making them very difficult to reach with most crop protection products. TELONE™ soil fumigant is injected 18" deep into the soil as a liquid and quickly converts to a gas. The vapors move through soil pores and eventually dissolve into soil moisture particles. That movement through the soil is fundamental and essential for effective pest control.

Proper soil fumigation also kills old tree and grapevine roots, which can provide a food source for a variety of soil-borne plant pathogens and insects. TELONE™ does more than just kill old roots and manage nematodes and soil-borne diseases; it creates a zone of protection around roots, allowing them to grow better, stronger and faster. The increased growth provided by soil fumigation (compared to untreated) is so dramatic that the cost of fumigation is often paid for with the first crop harvested.

WHY CROP UNIFORMITY IS IMPORTANT

To efficiently produce a crop, plant uniformity is a must. Consider the effect of plant uniformity on just two inputs: fertilizer and water. Generally, these two inputs are spread throughout orchards and vineyards evenly. That is to say, the plant at the beginning of the row gets the same amount of water as the plant at the end of the row. Fertilizer – applied through orchard airblast sprayer or irrigation line – is applied evenly throughout a block.

TELONE™ Soil Fumigant

The most efficient use of these inputs – so that there is little overuse or underuse – requires uniform plants. That's where soil fumigation can help. Replant disease and nematodes can be scattered throughout a field. Nematode "hot spots" are common. These hot spots create areas of an orchard or vineyard where plant growth is different. In a non-uniform crop, either some plants get shortchanged or some inputs are wasted. TELONE™ soil fumigant can help create uniform root systems that lead to above-ground growth that is also uniform.


Fumigated with **TELONE™**. 2nd leaf. Notice tree uniformity.

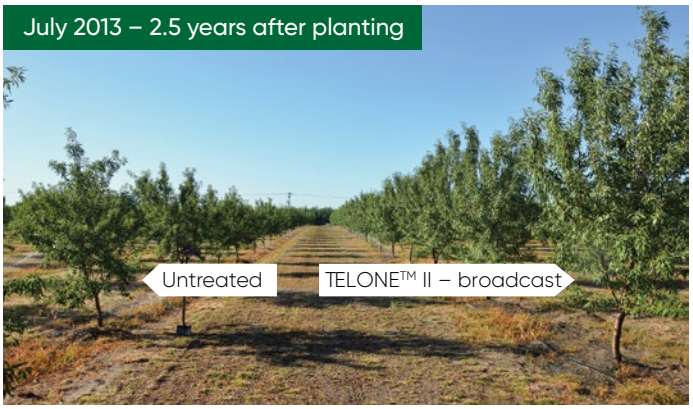
FIELD TRIALS

UNIVERSITY OF CA, USDA-ARS FIELD TRIAL

An ongoing trial in Merced County is evaluating various fumigants in almonds in a true replant site – almonds to almonds. The previous orchard was removed in early fall 2010. Replanting took place in January 2011 on Nemaguard rootstock. There was heavy nematode pressure (ring, lesion, root knot) in the sandy-textured soil prior to treatment.

Yields have been measured since 2013. Cumulative yields through 2018 show that plots treated with a broadcast application of TELONE™ II are 80% higher than the yields in the untreated plots. Learn more online at the Almond Board of California Research Database.

80%
Yield Increase
(TELONE™- Broadcast vs. untreated)



Merced County – Univ. of CA, USDA-ARS. An ongoing trial is evaluating various treatments for nematodes and Prunus Replant Disease (PRD). True replant situation – almonds to almonds. Heavy nematode pressure in the sandy-textured soil prior to treatment. Treatments, including TELONE™ soil fumigant, applied in November 2015. Photo taken in May 2016 shows fumigation with TELONE™ resulted in significant increase in trunk diameter, tree height and tree canopy size compared to untreated tree.

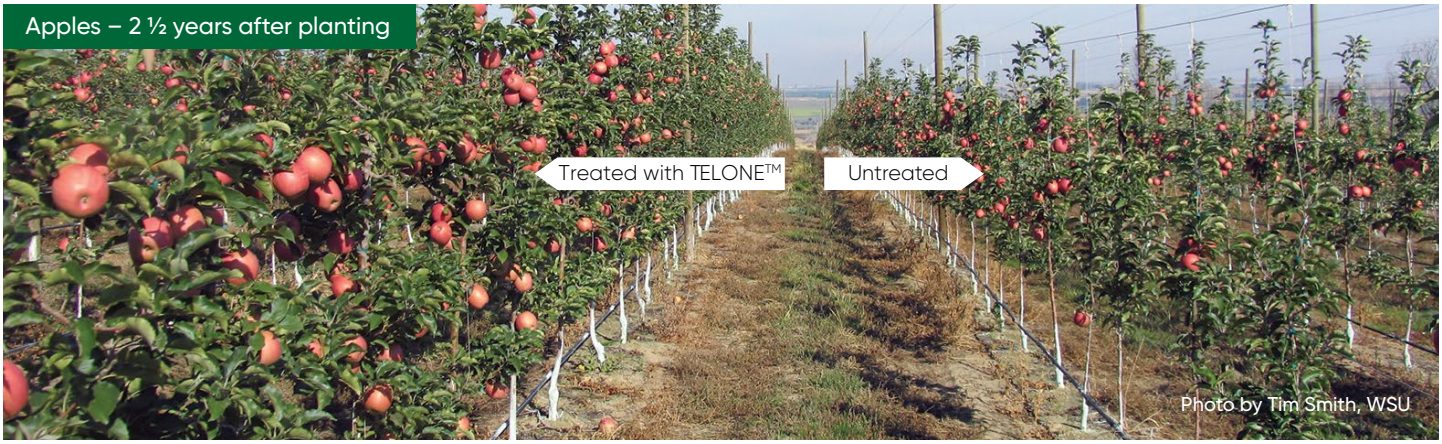
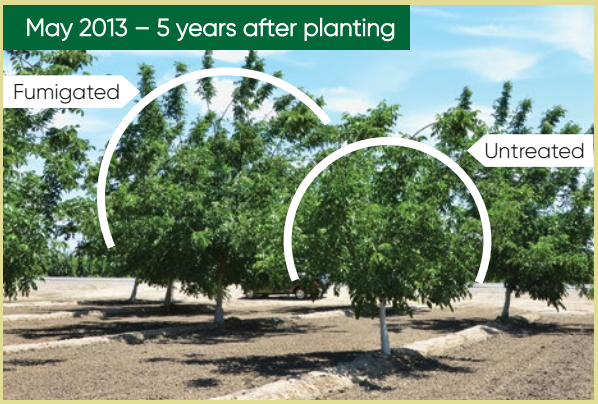
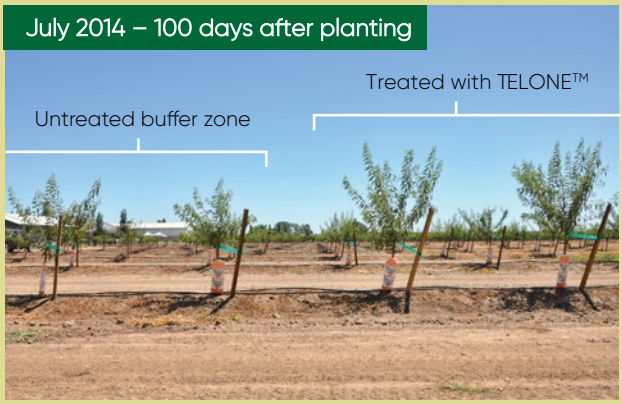


PHOTO GALLERY

Fresno County. Almonds-to-almonds replant site. No fumigation. Photo taken eight months after planting. Notice lack of uniformity throughout field.





▲ 2nd-leaf almonds planted at same time in same block. Field previously in grapes. ▲

Ring nematodes can predispose almonds to bacterial canker

FUMIGATION WORKS BEST IN THE FALL

In order for TELONE™ soil fumigant to effectively and uniformly move through the soil to control pests, proper soil conditions (such as soil moisture and temperature) must be present. In the fall, proper soil conditions are more likely present. Winter/spring weather and soil conditions are generally more unpredictable. Furthermore, there is more time in the fall for the soil preparation activities necessary to create the proper planting environment.

BEFORE YOU FUMIGATE...

Deep rip

Deep ripping (as deep as 6 feet) or backhoeing helps fracture the soil, breaking up hard pans and opening up the soil so that TELONE™ more easily moves through the soil. Even sandy soil can benefit from deep ripping. If ripping, consider ripping in two directions. A university study in Merced County has shown that backhoeing, alone, generates a growth response in trees.

Remove old trees or vines as soon as possible

The longer the interval between tree/vine removal and fumigation, the better, as pest populations decrease over time. Keep in mind, though, that leftover roots can remain alive for years. Nematodes can survive within roots, so as many roots as possible should be removed – either by hand or with a “root rake.”

Break up clods

Fumigants move best in well-tilled soil. Large clods should be broken up because fumigants cannot easily penetrate them. Clods can also prevent proper soil sealing at the surface.

Well-tilled and well-sealed soil

Soil that has been extensively worked through tillage operations will allow the fumigants to adequately move – in all directions – through the soil profile. That same, well-tilled soil will also allow for proper “sealing” at the soil surface.

To Learn More

Contact your certified dealer for TELONE™ or your Teleos Ag Solutions TELONE™ Specialist.

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