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For Research and Pest Management Considerations, Pear Psylla Monitoring

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Abstract. Pears are a delicious fruit with over 3000 varieties around the world. In value terms, pear production totaled $X in 2021 estimated in export price. China (X tons) constituted the largest volume of pear production, surpassing the figures recorded by the second-largest producer, the United States (X tons). The global average pear yield rose modestly to X tons per ha in 2021, picking up by 3% against 2020 figures. The most prominent rate of growth was recorded in 2016 with an increase of 6.4%. Over the period under review, the average pear yield reached the maximum level in 2021 and is likely to see steady growth in years to come. Aphids, codling moths, and pear psylla are all pests that can cause damage to pear trees. Aphids can be knocked off with water and insecticidal oils, while codling moths produce up to four generations per year and the larvae tend to cause the most damage. Pear psylla is a damaging pest that can cause rapid and total reduced tree vigor, eventually killing the tree.

Keywords: pests, pear, fruit, monitoring, research, aphids

Introduction. Pears are a delicious fruit but if you've just discovered them, you might be overwhelmed at all the different varieties. We'll look at ten of the most common types of pears so you know how to eat them, when to eat them, and why they're just so delicious. There are over 3000 known varieties of pears around the world. However, in North America, there is a more limited selection in most grocery stores. Pears do have a typical shape, that is rounded on the top with a larger roundness at the bottom. However, some pears will have longer necked while other pears appear more like a round apple than anything else. In value terms, pear production totaled $X in 2021 estimated in export price. The total output value increased at an average annual rate of +3.1% over the period from 2012 to 2021; the trend pattern remained consistent, with only minor fluctuations being recorded throughout the analyzed period. The pace of growth was the most pronounced in 2013 when the production volume increased by 16% against the previous year. Over the period under review, global production attained the maximum level in 2021 and is expected to retain growth in the near future. China (X tons) constituted the country with the largest volume of pear production, comprising approx. 73% of total volume. Moreover, pear production in China exceeded the figures recorded by the second-largest producer, the United States (X tons), more than tenfold. The third position in this ranking was taken by Argentina (X tons), with a 2.5% share. In China, pear production increased at an average annual rate of +1.1% over the period from 2012-2021. The remaining producing countries recorded the following average annual rates of production growth: the United States (-2.2% per year) and Argentina (-2.9% per year). The global average pear yield rose modestly to X tons per ha in 2021, picking up by 3% against 2020 figures. The yield figure increased at an average annual rate of +1.8% over the period from 2012 to 2021; the trend pattern remained relatively stable, with only minor fluctuations being observed throughout the analyzed period.

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Pic. 1 Pest damage

The most prominent rate of growth was recorded in 2016 with an increase of 6.4%. Over the period under review, the average pear yield reached the maximum level in 2021 and is likely to see steady growth in years to come. Despite the increased use of modern agricultural techniques and methods, future yield figures may still be impacted by adverse weather conditions. It seems like aphids love to infect all sorts of plants, including pear trees. These tiny pests' group underneath the leaves, sucking out the plant juices and leaving a secretion behind called honeydew. This leaves a growth media for sooty mold to form on your pear trees. Typically, aphid infestations aren't a huge deal unless they get out of hand. You can knock them off the tree with jets of water from your hose. Neem oil or other insecticidal oils kill the eggs; many insecticides work for aphids.

Most people don't know about these pear pests, but they cause a lot of damage to fruit trees. They like to burrow and cause holes in the pear fruits; these holes are often blocked with brown frass (insect excrement). Some holes are shallow, but others burrow deeply into the fruit, reaching the core. It's important to understand the lifecycle of a codling moth; they produce up to four generations per year. So, they easily infest your garden. The larvae tend to cause the most damage to your pear trees.

Pic.2 Pear Psylla

Pear Psylla One pear tree pest that is known to cause serious problems is the pear psylla. This is a damaging pest for pear trees, and it's known for developing a resistance to most insecticide options. An

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infestation causes rapid and total reduced tree vigor, eventually killing the tree with a disease called pear decline.

Pic.3 (Leafrollers)

Chemical management. In orchards with a history of psylla infestations, insecticidal control begins with a strong prebloom spray program designed to eliminate as many overwintering adults as possible before they have the opportunity to lay many eggs. As with all psylla sprays, good coverage is critical for control of this pest. All sprays should be applied to both sides of the trees and in a volume of water high enough to thoroughly wet and cover the entire tree. In most situations, this requires at least 100 gallons per acre. Surfactants may be added to achieve better coverage. Alternate row middle applications are not recommended unless tree size is quite small.

The first application should include oil, which has been shown to delay egg laying by over 95 percent for a 5-week period, plus an adulticide to eliminate adult psylla overwintering on the tree. This application also serves to concentrate in time a higher proportion of pesticide-vulnerable individuals later in the season. Typically, egg deposition and hatch occur over a long period of time, making pesticide timing difficult. Early season oil sprays "bunch up" the population so sprays can be more easily targeted. The early season oil application must be applied prior to egg maturation in the female psylla. For growers in south-central Pennsylvania, this application should be made in most years by March 15-20.

With the oviposition period delayed, the delayed dormant spray (bud burst) becomes extremely important because additional adult control can be achieved by waiting until adult psylla that are living away from the pear tree return from their overwintering sites. This spray should again contain oil as well as an adulticide such as one of the synthetic pyrethroids. The next prebloom spray should be applied between the green cluster bud stage and the white bud stage. This is the period when first-generation eggs begin to hatch. A number of very effective insecticides are available for this spray.

The next vulnerable period occurs at petal fall, when the first-generation nymphal population is usually at its peak. Since petal fall is a key period for the activity of other pests that attack pears, it is usually necessary to add a broad-spectrum organophosphate insecticide at this time. If the four applications recommended thus far are carefully applied, psylla populations should be very low.

The next major period to control psylla is not until the second generation of nymphs begins hatching about mid-June. A second application should be repeated within 10 to 12 days of the first to control additional nymphs hatching from eggs. If the population warrants additional applications, these can be made against the third generation of nymphs, which usually begin hatching around mid- to late July. Since the second and third generations tend to overlap during the season, close attention should be given to determining which nymphal stages are present, since insecticides are most effective when directed against the early instars. Growers should rotate to different insecticidal chemistries for each spray

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