Guidelines for Growing Hazelnuts in New Zealand

Bulletin 6: Orchard Management

Murray Redpath, LA & LM McCracken. May 2016

Overview

Established orchards need to be managed with the aim of maximising the area of fruiting canopy and ensuring the orchard floor is maintained to enable efficient harvesting and high quality nuts.

Seasonal jobs

All year
- Mowing and weed control
- Monthly sucker control

Winter
- Pruning
- Apply winter oil to control scale and aphids
- Maintain shelter

Spring
- Apply fertiliser
- Spray for Big Bud Mite (October)
- Apply foliar boron (late October/November)
- Check irrigation system

Summer
- Leaf/soil analysis
- Prepare ground for harvest

Autumn
- Harvest
- Spray copper to control bacterial blight
- Post-harvest cleaning of orchard floor

Orchard Floor Management

LA and LM McCracken

Introduction

Orchard floor management can be split into two components:
- Management of the crop row
- Management of the row between the crop trees

Different strategies will be adopted for both areas depending on:
- Whether the orchard practises organic or a conventional management system
- The harvesting system used or proposed

This bulletin deals solely with a conventional management system.

If you are using herbicide sprays in the orchard then you are subject to the Hazardous Substances and New Organisms Act (HSNO). Depending on the volume of sprays stored and used, spray users may need to be certified as Approved Handlers and store sprays under approved conditions.

Appendix 1 includes a spray record sheet that should be used each time sprays are used.

This bulletin assumes that the orchard has been developed following defacto standards that some recent Canterbury orchards have adopted, namely:
- Row width – tree to tree is 4.5m
- Mower width 1.8m maximum
- Crop row width to allow for mower overlap and two runs per strip.
Fig. 1 shows the resultant geometry. This will vary from orchard to orchard based on the tree spacing and mower width.

![Diagram of Orchard Floor Layout]

**Spray Application Systems**

The choice of application system will depend on the size of the orchard. For orchards over about 1,000 trees, some form of mechanised sprayer is likely to be required. These can take the form of a quad-bike modified to take a sprayer or a tractor mounted spray tank system. Both can be set up with:

- A front boom for crop row spraying, and
- A rear boom for control of unwanted grasses and weeds in the inter-row mowed strip.

**Spraying Programme**

Weed control should be timed around the onset of winter, when most weeds lie dormant, and harvest, when weeds in the crop row can make harvesting difficult. Table 1 shows a typical spray programme.

Weed control also needs to be timed around sucker control to prevent damage to the crop tree during weed control. If suckers are allowed to remain uncontrolled for too long then the sucker will absorb the herbicide used for weed control, which may affect tree growth and can kill young trees.
Timing | Activity
--- | ---
Early May | Spray crop rows prior to winter
Late September to early October | First crop row spray in Spring Control suckers
December | Routine spray Control suckers
February | Spray to ensure weeds controlled before harvest Control suckers

Table 1: Spray Programme

Crop Row Management

Management of the crop row consists of weed and sucker control to:

- Eliminate competition between unwanted species and the crop trees for water and nutrients
- Eliminate unproductive crop tree growth
- Create an environment that makes harvesting easier and more efficient

Weed Control

Complete control of unwanted grasses and weeds is possible using foliar sprays, which can be systemic or non-systemic, and which kill the plant through direct contact with the foliage.

Combinations of two spray types are sometimes used. Examples of foliar sprays are:

- A combination of Glyphosate and Granstar, which are systemic sprays that move through the whole plant, and;
- Buster, which is a non-systemic spray that burns the leaves and soft stem of the plant.

The selection of spray system is a personal choice and you should consult your adviser or spray manual to select the system that best meets your preferences. The use of a pre-emergent spray like Simazine will reduce the number of times the crop row requires spraying but has a more harmful effect on the environment than, for example, Glyphosate. The examples given, apart from Glyphosate which is the generic chemical in the spray, are brand names and there are other brands available with the same active ingredient.

Short descriptions of some commonly used herbicides follow:

**Glyphosate**

A broad-spectrum, systemic, foliar spray that quickly breaks down in the soil. Controls most grasses and weeds. Glyphosate is an isopropylamine salt in the form of a soluble concentrate. It is toxic to aquatic organisms and breaks down in soil in 14 to 22 days and is practically immobile in the soil. Care is required when using around young trees where the bark has not lignified. In this situation some form of spray guard is recommended.

**Granstar**

A selective, systemic spray which controls most broadleaf plants. Can be mixed with Glyphosate. Granstar contains tribenuron methyl in the form of a water dispersible grain and is very toxic to aquatic organisms and the soil environment but breaks down in soil within 1 to 7 days.

Spray application rates will vary according to the herbicide used but typical rates follows:

- Glyphosate - 5 litre per hectare
- Granstar - 40 grams per hectare

Some herbicides benefit from the addition of adjuvants, which are chemicals added to the spray mixture to improve its performance. The most commonly used adjuvant is a surfactant which improves the ability of the spray mixture to wet the plant. Other adjuvants are rain proofers and drift control agents.

Herbicide application rates are generally specified in terms of volume per hectare and therefore require calibration of the sprayer to determine the effective spray volume delivered to the plant. A typical sprayer calibration sheet appears in Appendix 2.
**Sucker Control**

Most hazel cultivars throw suckers and unless these are controlled early they will create problems for harvesting. The suckers also take valuable nutrients and sunlight away from those parts of the crop tree you want to develop to maximise your crop.

Suckers can be controlled either mechanically by cutting the sucker or chemically by the use of a desiccant spray like Buster. Buster can also be used to control vegetative growth on the tree stem as a form of chemical pruning but care needs to be taken to ensure that the stem has lignified otherwise the tree may absorb the chemical and damage will occur.

The active ingredient in Buster is glufosinate ammonium in the form of a water soluble concentrate. Buster is primarily contact in action but has a slight systemic effect. Buster is toxic to aquatic organisms and very toxic to the soil environment and has a residual life of 3 to 20 days in the soil.

**The Inter-row Strip**

For most orchards a grass cover is used between the crop rows. Management of this area requires:

- Mowing, and
- Spraying for weeds

The type of grass planted will determine how often the strip requires mowing. For orchards developed using a slow growing grass like Medina Fescue, mowing from October through to April will be required every three weeks even when the strip is irrigated. For orchards with pasture type grasses in the strip that is irrigated, mowing during summer will be required at least every 7 to 10 days.

Regardless of grass type planted, it is advisable to control weed growth in the strip to prevent competition with the grass and to reduce the mowing frequency. Weeds tend to grow faster than grasses.

If Medina Fescue has been planted then it is possible to use a herbicide mixture (Gallant, Grazon, Combine) that will remove all grasses and weeds other than the fescue. If a standard pasture grass has been planted then a selective herbicide can be used to control broadleaf weeds but care is needed to avoid possible root damage to young trees from herbicides such as Versatill. Short descriptions of some commonly used herbicides follow (all are systemic):

**Gallant**

A selective herbicide that controls grasses. The active ingredient is haloxyfop as the methyl ester in the form of an emulsifiable concentrate. It is not toxic to aquatic organisms or the soil environment and breaks down within 24 hours in soil.

**Gazon**

A broad-spectrum herbicide that controls grasses. The active ingredient is triclopyr in the form of an emulsifiable concentrate. It is very toxic to aquatic organisms and the soil environment. If 3 litres or more of Grazon is used where the substance is likely to enter water or air and leave the place then records must be kept on the use of Grazon. Records must also be kept if 3 litres or more is used in any 24 hour period.

**Combine**

A non-hormonal post-emergent herbicide for broadleaf weed control. The active ingredients are bromoxynil and ioxynil in the form of an emulsifiable concentrate. It is toxic to aquatic organisms and very toxic to the soil environment.

**Preside**

A selective, post-emergent herbicide for broadleaf weed control. The active ingredient is flumetsulam in the form of a water dispersible granule. Preside is one of the few herbicides that will control field mallow. It is very toxic to aquatic plants and some other plant species and has a soil half-life of 1 to 2 months.
**Versatill**

A herbicide for the control of various broadleaf weeds in turf grasses. The active ingredient in Versatill is clopyralid as an amine salt in the form of a water soluble concentrate. It is toxic to aquatic organisms, very toxic in the soil and very toxic to earthworms. Grass clippings from turf sprayed with Versatill can remain toxic to other plants for up to 6 months after spraying.

Spray application rates will vary according to the herbicide used but typical rates are:
- Gallant 2 litre per hectare
- Grazon 1 grams per hectare
- Combine 1 litres per hectare
- Preside 50 to 65 grams per hectare
- Versatill 1 to 2 litres per hectare depending on the predominant weed

**Pruning**

**M. Redpath**

All fruiting plants need light to set fruiting buds and to ripen a heavy crop. For hazels, research has shown that the highest yields occur on new wood with an annual extension growth of at least 15 cm and hazelnut crop yields start declining once light levels fall to about 70% of full light. For young orchards, only light maintenance pruning is required, aiming to maintain a branch structure allowing light throughout the tree, to produce 15-30 cm growths throughout the canopy. This would remove branches that are crossing over each other or strong vertical shoots growing up through the canopy.

Pruning requirements change as the trees get larger and the canopies start to meet within the rows. Growers can either prune every tree each year or prune a part of the orchard every few years.

USA growers usually prune 20% of the orchard each year (every plant pruned every five years), cutting 50% of the wood off the trees being pruned. Yield falls the first year after pruning but is back to normal in the second year. This system is based on the growth of vigorous varieties such as Barcelona, which are allowed to develop into large trees over 5 metres high, and which require ladders or other elevation systems to reach the canopy for pruning.

Alternatively, each tree can be pruned every year (removing 20-30% of the bearing wood). This system may be more applicable to low vigour varieties such as Whiteheart that can be maintained as smaller trees, allowing pruning from the ground or from short orchard ladders.
How do I know if a tree needs pruning?

1. If trees fail to produce 15-30 cm of annual extension growth on branches in orchards with good fertiliser and soil management, then pruning is required to rejuvenate the canopy. The presence of catkins is a good indicator of the location of fruiting wood.

2. If numerous dead twigs appear in the tree centre and lower branches (provided there are no severe Big Bud Mite infestations or hazel blight symptoms), then light is not reaching those areas. Pruning to let light in will re-establish productive cropping wood in the lower parts of canopy.

The following sequence can help determine what wood to remove:

1. Remove unwanted branches:
   - branches that are too low and get in the way of orchard operations
   - branches that are diseased or badly affected by borer.
   - branches that cross each other – aim for well spaced branches facing out from the centre of the tree

2. Remove strong vertical growths rising through the canopy from lower branches unless you can use these to fill an opening in the tree.

3. Clean all short unhealthy growth back to the scaffold branches. If there is sufficient light then new buds will replace these twigs with 15-30 cm cropping growths.

4. Strong cropping growths can be trimmed back to the outermost flower bud to limit further extension of those growths (e.g. to stop further growth on the outside of the canopy).

After pruning, light should penetrate to all parts of the tree. A gap should be maintained in the canopy between rows to allow light to penetrate to the base of the trees.

Rehabilitating overgrown orchards

As trees get taller and crowd together, light levels fall in the centre of the tree and the lower canopy and the productive surface becomes restricted to the upper third of the canopy. Excessive shading reduces flower bud initiation and nut growth, and yields and nut quality both fall. Overcrowded orchards have numerous dead branches and increased problems with disease and insect pests. Major pruning is required involving lowering of the canopy, thinning and/or shortening of the main scaffold branches and possibly tree removal.

1. Decide whether to keep the original spacing or to thin every second tree out. Trees maintained at the original spacing need to have the canopy lowered more than if the planting is to be thinned. If thinning, then
removing trees in a diagonal thinning system will give the greatest space for each remaining tree.

- Remove all suckers.
- Cut the trees back to the main scaffold system.
- Thin the scaffold branches
- Head the branches back to the desired height or length.

Heading tends to cause a large number of vigorous shoots to grow just below the cut. These growths can cause excessive shading of adjacent branches whereas thinning branches lets in light to adjacent branches.

Care must be taken when pruning not to damage the branch collar, the raised area at the base of the branch. The branch collar has specialised cells that help seal off the pruning wounds. Cut the branch flush with the outside of the branch collar, not flush with the trunk. Do not leave stubs of wood beyond the branch stub as these may become infected with wood rot fungi (Fig. 5.).

Fig 5: This branch should have been cut back at the branch collar (marked). It has become infected with wood rot fungi which are now able to grow back into the main trunk.

Fig 6: Active regrowth where branches have been cut back to the main scaffold branch. These need to be thinned to a maximum of 3 shoots.

2. Open up a gap between rows, remembering that established trees will respond vigorously to pruning and grow into the new light gaps. To maintain a 1 metre gap between rows, the main scaffold branches in opposite rows will need to be at least 1 to 2 metres apart (depending on vigour of variety).

If vigorous suckers have crowded out the original tree, a suitable large sucker can be selected and headed back to establish a new scaffold system. Alternatively, 2 or 3 suckers can be headed back and a new scaffold system developed. This allows for a more rapid replacement of a full bearing canopy than with a single replacement sucker.
When to prune

Removal of diseased branches and unhealthy twigs can be done any time between the end of harvest and bud burst. It can be useful to have leaves on when trying to prune a tree with crowded branches – allows an assessment of the level of light penetration.

Final pruning or light annual pruning is best done during main flowering period as the flower buds can become easily seen. It is also advisable to do most of the large cuts in late winter so the wounds can heal rapidly during spring growth.

Fertiliser

Orchard fertiliser requirements

A well managed fertiliser programme will ensure that optimum nutrient levels are available for tree growth. Fertiliser requirements can be determined using soil tests to measure the nutrient supply available in the soil, and leaf analysis to determine the levels of these nutrients in the plant.

Soil tests should be taken prior to planting and fertiliser applied to correct major deficiencies, especially potassium and magnesium. Liming will be necessary if the pH of the soil is less than 5.6. The aim should be to lift the soil to a pH of 6.5 or more. After planting, regular soil testing will allow growers to monitor changes in the soil nutrient status. Growers should aim to lift soil nutrient levels to those recommended below.

<table>
<thead>
<tr>
<th>Table 2: Soil nutrient levels for hazelnuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit</td>
</tr>
<tr>
<td>pH</td>
</tr>
<tr>
<td>Olsen Phosphorous</td>
</tr>
<tr>
<td>Potassium</td>
</tr>
<tr>
<td>Calcium</td>
</tr>
<tr>
<td>Magnesium</td>
</tr>
<tr>
<td>Sodium</td>
</tr>
<tr>
<td>CEC</td>
</tr>
<tr>
<td>Available Nitrogen</td>
</tr>
</tbody>
</table>

Young trees benefit from small amounts of controlled release fertiliser. Do not place fertiliser in the planting holes as this may burn the new roots. Sprinkle fertiliser evenly on the soil surface around the newly planted tree.

Young trees should grow 50 to 100 cm annually.

Leaf sampling should start once the trees start cropping. Nutrient levels in the plant are influenced by weather and crop load so regular leaf testing will allow growers to monitor any trends that are developing and modify the fertiliser program accordingly. Leaves should be sampled in January; collect the leaves from the
mid-shoot of the current season’s growth. Collect about 100 leaves randomly from throughout the orchard.

Table 3: Plant leaf analysis standards (normal range) for hazelnuts (as recommended by Oregon State University Extension Service)

<table>
<thead>
<tr>
<th>Element</th>
<th>% dry weight</th>
<th>ppm dry weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen</td>
<td>2.21 - 2.5</td>
<td></td>
</tr>
<tr>
<td>Phosphorous</td>
<td>0.14 - 0.45</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>0.81 - 2.00</td>
<td></td>
</tr>
<tr>
<td>Sulphur</td>
<td>0.13 - 0.20</td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>1.01 - 2.50</td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>0.25 - 0.50</td>
<td></td>
</tr>
<tr>
<td>Manganese</td>
<td>26 - 650</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>51 - 400</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>5 - 15</td>
<td></td>
</tr>
<tr>
<td>Boron</td>
<td>31 - 75</td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td>16 - 60</td>
<td></td>
</tr>
</tbody>
</table>

**Fertilising**

An ideal fertiliser programme should aim to maintain nutrient levels within the normal ranges detailed above. Application can be via ground application of solid fertiliser (broadcast or banded along the drip line), foliar sprays, or via the irrigation system. Nitrogen, potassium and boron are the elements that are most commonly deficient in hazels.

**Nitrogen**

Hazelnuts are high in protein and the nitrogen in this protein is removed from the orchard at harvest. Early spring growth uses nitrogen reserves stored in the tree from the previous season. Soil applications of nitrogen fertilisers should be applied in the spring during the period of greatest tree growth to maximise uptake and restore the nitrogen levels in the tree prior to the main period of kernel development. Split applications can help minimise the potential for nitrogen leaching through the soil.

Rates of nitrogen should be determined using leaf analysis and observations of growth in the orchard. New growth at the end of the growing season should be 30 to 50 cm long on mature trees, and lower growth rates may indicate a nitrogen deficiency. Excessive nitrogen application should be avoided as this increases vegetative growth which can lead to increased shading of cropping wood and extra pruning.

Animal manures are sometimes used as a source of nitrogen, especially in organic orchards. Care must be taken to ensure that any manure is well composted to avoid problems with elevated levels of *Salmonella* and/or *E.coli* on the orchard floor. No manure should be present on the soil surface at harvest.

**Potassium**

Potassium is slower acting than nitrogen and is commonly applied in autumn if leaf analysis indicates a shortage. Severe potassium deficiency can be indicated by small leaves dying around the edges and abnormally short husks surrounding the nuts.

High potassium levels affect the uptake of magnesium so potassium should only be applied if a deficiency exists.

**Boron**

Adequate boron levels are essential to ensure good nut set. Boron deficiency is indicated by die back of shoot tips and loss of leaves at the base of new shoots. Boron can be toxic if used in excess but hazels do not show signs of toxicity until leaf boron levels exceed 200 ppm.

Boron is very soluble in the soil and is usually applied as a foliar spray in the spring. Organic growers can use ground applications of Ulexite, a boron rich mineral found in evaporite deposits.

**Summary**

Best practice orchard management systems use adequate fertiliser to ensure high yields, but avoid excessive application.

Base applications on soil tests and leaf analysis.

When using foliar or high analysis fertiliser blends, follow the manufacturer's recommendations.
Further reading


The “Guidelines for Growing Hazelnuts in New Zealand” bulletins were produced by the Hazelnut Growers Association of NZ with financial assistance from the Ministry for Primary Industries Sustainable Farming Fund and the NZ Tree Crops Association.

Murray Redpath is Chairman of the Hazelnut Growers Association of NZ.
Les and Linda McCracken are hazelnut growers in Canterbury

All photographs: Murray Redpath

Disclaimer

While the author has taken all reasonable skill and care in assessing the accuracy of the information in this report, none of the organisations involved accepts any liability, whether direct, indirect or consequential, arising out of the provision of information within this report.
**Spray Calculation Sheet**

<table>
<thead>
<tr>
<th>Number of nozzles</th>
<th>2</th>
<th>Nozzle flow rate:</th>
<th>Time for 1 litre</th>
<th>0.87</th>
<th>min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boom height above ground</td>
<td>340 mm to underside of boom structure</td>
<td>Flow rate</td>
<td>1.15 l/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boom distance from row centre</td>
<td>140 mm to end of boom structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boom angle via chain</td>
<td>4th link of chain in slot</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boom flow rate</td>
<td>2.30 l/min</td>
<td>Boom spray width</td>
<td>0.60 m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tractor speed:</td>
<td>Tractor rpm</td>
<td>1500 r/min</td>
<td>Tractor gear</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>Time for distance</td>
<td>200 min</td>
<td>Speed</td>
<td>7.19 km/hr</td>
<td>119.76 m/min</td>
<td></td>
</tr>
<tr>
<td>Boom angle via chain</td>
<td>4th link of chain in slot</td>
<td>Boom flow rate</td>
<td>2.30 l/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boom spray width</td>
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<td>0.60 m</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>1500 r/min</td>
<td>Tractor gear</td>
<td>B</td>
<td></td>
</tr>
<tr>
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<td>200 min</td>
<td>Speed</td>
<td>7.19 km/hr</td>
<td>119.76 m/min</td>
<td></td>
</tr>
<tr>
<td>Sprayer Calibration Sheet</td>
<td></td>
<td>Sprayer Calibration Sheet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speed</td>
<td>7.19 km/hr</td>
<td>119.76 m/min</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spray vol.**

\[
\text{spray rate (l/min)} = \text{spray volume per unit of area (x10000 for l/ha)}
\]

**area covered (sq m/min)**

\[
\text{Spray volume} = \frac{\text{tank vol. x product/ha}}{\text{l/ha}}
\]

**Tank load**

400 l

**Spray Volumes per Tank:**

<table>
<thead>
<tr>
<th>Gallant</th>
<th>2 l/ha</th>
<th>2.50 l/tank full</th>
<th>Contact added @ 150 ml per 100 l</th>
<th>Tank Volume</th>
<th>Buster litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grazon</td>
<td>1 l/ha</td>
<td>1.25 l/tank full</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combine</td>
<td>1 l/ha</td>
<td>1.25 l/tank full</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Versatil</td>
<td>1 l/ha</td>
<td>1.25 l/tank full</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glyphosate</td>
<td>5 l/ha</td>
<td>6.25 l/tank full</td>
<td></td>
<td>15</td>
<td>250</td>
</tr>
<tr>
<td>Granstar</td>
<td>40 gm/ha</td>
<td>50.01 gm/tank full</td>
<td></td>
<td>10</td>
<td>167</td>
</tr>
<tr>
<td>Gardoprin</td>
<td>12 l/ha</td>
<td>15.00 l/tank full</td>
<td></td>
<td>5</td>
<td>83</td>
</tr>
<tr>
<td>Preside</td>
<td>55 gm/ha</td>
<td>68.77 gm/tank full</td>
<td></td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Gesatop</td>
<td>6 l/ha</td>
<td>7.50 l/tank full</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Spray addition rates for less than a full tank:**

<table>
<thead>
<tr>
<th>Tank Vol. litres</th>
<th>Gallant litres</th>
<th>Grazon litres</th>
<th>Combine litres</th>
<th>Versatil litres</th>
<th>Glyphosate litres</th>
<th>Granstar grams</th>
<th>Gardoprin litres</th>
<th>Preside grams</th>
<th>Gesatop litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0.3</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.8</td>
<td>6.3</td>
<td>1.9</td>
<td>8.6</td>
<td>0.9</td>
</tr>
<tr>
<td>100</td>
<td>0.6</td>
<td>0.3</td>
<td>0.3</td>
<td>0.3</td>
<td>1.6</td>
<td>12.5</td>
<td>3.8</td>
<td>17.2</td>
<td>1.9</td>
</tr>
<tr>
<td>150</td>
<td>0.9</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
<td>2.3</td>
<td>18.8</td>
<td>5.6</td>
<td>25.8</td>
<td>2.8</td>
</tr>
<tr>
<td>200</td>
<td>1.3</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>3.1</td>
<td>25.0</td>
<td>7.5</td>
<td>34.4</td>
<td>3.8</td>
</tr>
<tr>
<td>250</td>
<td>1.6</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>3.9</td>
<td>31.3</td>
<td>9.4</td>
<td>43.0</td>
<td>4.7</td>
</tr>
<tr>
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