WEED CONTROL AROUND YOUNG APPLE TREES

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Summary

Young apple trees grew better where grass growing around them was hoed or sprayed with paraquat, but made still better growth where spraying was followed by hoeing two months later. Control of vegetation gave a lesser increase in tree growth in successive growing seasons, until in the fifth season after transplanting there was no measurable increase.

INTRODUCTION

IN 1963 the writer reported to this Conference improved growth of young fruit trees from control of vegetation around them. Chemical treatment was as good as hoeing but could not be recommended without reservation because none of the trials extended over more than two years. The trial of highest accuracy has been kept going for five seasons and is reported below.

METHOD

Sixty Sturmer apple trees on Spy stock transplanted into a short-rotation ryegrass (*Lolium* hybrid spp.) white clover (*Trifolium repens*) pasture received uniform treatment the first season, which included control of grass with 2,2-DPA followed by hand-hoeing and watering.

The trees were divided into four groups of 15 trees and have since received no water or straw, but each group has received a different treatment of the grass in 5 ft diameter circles about the trees.

- (1) *Sprayed and hoed*. Sprayed with paraquat at 0.04% cation to saturation in September and again in October. Rotary-hoed in December.
- (2) *Sprayed*. As above but without hoeing.
- (3) *Hoed*. Hand-hoed in October. Rotary-hoed in December.
- (4) *Untreated*.

Short-rotation ryegrass re-established and grew heavily in cultivated ground each autumn. Plots sprayed but not cultivated were somewhat bare and contained mainly white clover and sorrel (*Rumex acetosella*).

The orchard was grazed by sheep in winter but not mowed. The trees were fertilized, sprayed and pruned in the normal manner.

RESULTS AND DISCUSSION

Figure 1 shows tip growth for a typical growing season beginning with wet soil in spring. Trees which were sprayed around made poorer growth than other trees for two months. This lesser growth was highly significant and has been observed also with pears. It is ascribed to too much water around the tree roots because it does not occur following a dry winter.

Fig 1: Tip growth for a typical growing season with different treatments.

When water reserves in the soil near the trees had been used—sooner where vegetation was not controlled—the growth of the young tree was arrested. Removal of vegetation round November has been found much too late for young trees; early spraying is needed to prevent the arrest of tree growth about Christmas.

Tree growth year by year is summarized in Table 1. Trunk circumference is accepted as a good criterion of tree growth, especially as the trees grow older, and is given in Table 2.

Table 1 indicates progressively less benefit from controlling vegetation around young trees as they grow older. If allowance is made for improved growth also in the first season, it can be concluded that control

TABLE 1: MEAN LENGTH OF TALLEST SHOOTS (cm)

	<i>Sprayed + Hoed</i>	<i>Sprayed</i>	<i>Hoed</i>	<i>Untreated</i>	<i>LSD</i> (<i>P</i> < 0.05)
1961-2	All trees had same treatment				
1962-3	90	84	72	59	5
1963-4	71	63	61	57	6
1964-5	118	114	112	109	5
1965-6	129	127	126	130	6
1966-7	100	98	97	104	5

TABLE 2: MEAN MINIMUM TRUNK CIRCUMFERENCE (cm)

	<i>Sprayed + Hoed</i>	<i>Sprayed</i>	<i>Hoed</i>	<i>Untreated</i>	<i>LSD</i> (<i>P</i> < 0.05)
July 1965	12.6	11.8	11.6	11.0	0.4
July 1967	19.0	17.9	17.3	16.5	0.7

of competing vegetation would allow the tree to reach a given size one year sooner. This implies that the tree could be allowed to bear fruit one year sooner.

For the first two years of this trial, powdery mildew was significantly less where vegetation was controlled.

It should be carefully noted that cultivation was not done in this trial until the second spraying—*i.e.*, about October—but that the first spraying was done a month sooner—*i.e.*, in September. The justification for giving spraying the advantage of a month's start is that most orchardists are busy in September with manuring, pruning and replanting, and can perhaps find time for spraying around trees but not for digging around them which takes twenty times as long.

Killing the vegetation close to the trees six weeks earlier allows cultivation by hand tools or small rotary hoe to be done more easily and three times as quickly. This combined treatment is cheaper than cultivation only, and in this and other trials has led to better tree growth. On the clay soil where the trial was done, soil structure was better where cultivation was done.

Cultivation begun earlier and done with thoroughness, digging in dried blood, rotted straw, etc., might well have led to still better tree growth. Apart from costly and laborious methods, spraying in spring followed by hoeing appears to be the best treatment for young trees. Straw could be laid after the cultivation, but this involves a large additional expense.

NOTE ON CHEMICALS

Paraquat has been used, not because of its superior safety to trees, but for its efficacy against the dominant weed, ryegrass. 2 lb (all rates in active ingredient) in 500 gal of spray has been found the weakest dilution which is effective applied in the evening. For morning application, the rate must be raised to 2 lb in 400 gal.

Amitrole diluted at 2 lb amitrole in 200 gal also sprayed to saturation has been found effective in early spring but inadequate for later applications against grasses. At this rate small trees have tolerated amitrole sprayed on part or even the whole of them. At higher rates, amitrole is much more harmful to trees and care is needed in applying it.

Much improved control of the docks, sorrel and blackberry (*Rubus fruticosus*) has been obtained by adding dicamba at one-eighth the active ingredient of the amitrole. This mixture needs careful application.