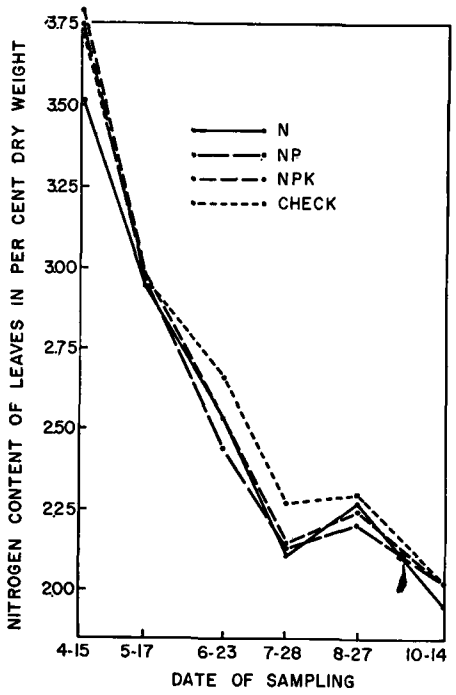
Fertilizer Trial with Plums

results of tests with Santa Rosa variety in principal plum growing area of Kern County determined by leaf analyses

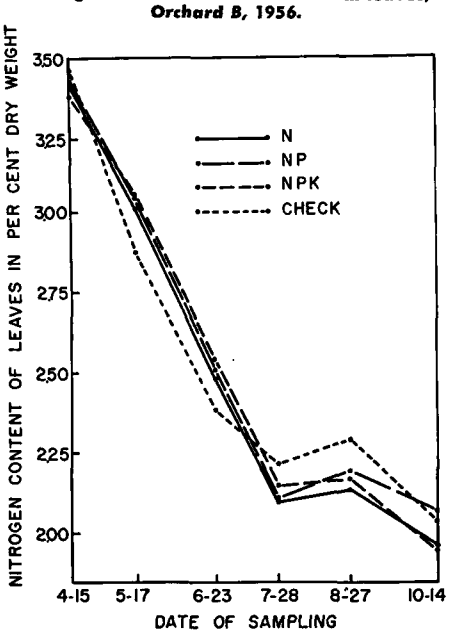
E. L. Proebsting and A. N. Kasimatis

Nitrogen content of Santa Rosa Plum leaves, Orchard A, 1956.
N—nitrogen
NP—nitrogen and phosphorus
NPK—nitrogen, phosphorus, and potassium



Two sets of experimental plots in 15-year old Santa Rosa plum orchards—on Marianna rootstock—were laid out north of Arvin in 1951. Orchard *A* had 75 trees per acre and was on Foster loam. Orchard *B* had 90 trees per acre on Hesperia fine sandy loam.

Nitrogen content of Santa Rosa Plum leaves, Orchard B, 1956.



Treatments

Treatments consisted of nitrogen; nitrogen plus phosphate; complete; and untreated check, each treatment replicated four times in each orchard. Nitrogen was applied as ammonium sulfate at the rate of 100 pounds of nitrogen per acre per year. Phosphate was applied at the beginning at 35 pounds of treble superphosphate—44%—per tree with an additional 35 pounds being applied in 1953. Potassium sulfate was applied at the same rate as the phosphate.

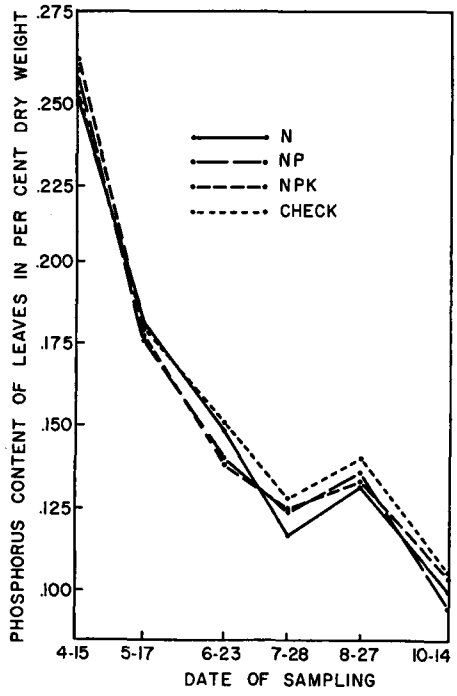
Yields were recorded and fruit size determined for each picking. Leaf samples for analysis were taken at approximately monthly intervals for the duration of the trials. Analyses for nitrogen, phosphorus, potassium, magnesium, calcium, and sodium were made on each sample. Manganese was determined on the samples collected the last three years.

The failure of the trees to absorb nitrogen is illustrated by the graphs to the left. Each point on each graph is the average of the analyses of four replicate plots. The curves are typical seasonal curves for nitrogen and are not excessively high for Santa Rosa variety. The phenomenon of failure of trees to absorb nitrogen has been encountered several times before in other areas with different fruit species. No satisfactory explanation has been found.

In the absence of nitrogen absorption, no response would be expected and such is the case. Yields and fruit sizes have not been influenced by the fertilizer.

The phosphorus curves, in the column on the right, show evidence of phosphorus absorption in one of the orchards. The usual experience in an experiment of this kind is that phosphorus is not absorbed, and where nitrogen is added, phosphorus is depressed. In this case, without nitrogen absorption phosphorus was not affected, and significant amounts of phosphorus were absorbed in one set of plots, in Orchard *B*. No explanation of the difference in behavior of the two orchards has developed. The level of phosphorus would be considered usual.

Phosphorus content of Santa Rosa Plum leaves, Orchard A, 1956.



Potassium, like nitrogen, was not absorbed as is shown by the graphs on page 14. Although the first three dates of sampling show higher potassium in both orchards for the plots receiving potas-

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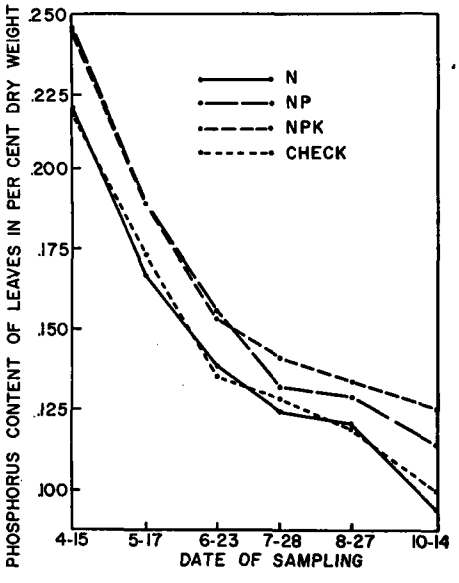
Phosphorus content of Santa Rosa Plum leaves, Orchard B, 1956.



CREDIT

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offered any kind of credit, none, with one exception, offered full credit. The exception was in Fresno where 86% of the stores with 7–14 employees which offered credit had full credit.

To be continued

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PARITY

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be gained from such regulation. The parity standard is intended to define prices that are fair to producers and consumers.

However, the argument has been advanced that the present parity index is unrepresentative of production and cost conditions for specialty crops and a more representative index would give greater weight to wages of hired labor and perhaps certain other inputs which bulk relatively large in specialty crop-production cost. Since the wages subindex stands at a higher level than any other, any increase of its weight will raise the over-all parity index. The amount of the increase would depend upon how offsetting decreases of weight are distributed among the other subindexes.

While certain types of special-purpose revision of the parity index for specialty crops could result in parity-price increases of perhaps 10%–20%, the prospects of obtaining such revision are remote. The contention that revision should be made appears to rest on the premise that the parity index should accurately represent production expenses of individual commodities or groups of commodities. A cost-of-production parity index would logically have to take into account decreases in cost as a result of increasing efficiency which might offset gains from other modifications.

A market control program that is effective in smoothing out short-run price fluctuations about a basic price level or in preventing disastrously low prices in unusual seasons may benefit both producers and consumers. It can stand without recourse either to the parity goal or the parity limitation. Prudently administered, with proper attention to consumer interests on the one hand and long-run supply responses on the other, marketing orders might conceivably function better without objective standards of any kind. But it is hardly conceivable that consumer safeguards could or should be eliminated from the law. Despite the deficiencies of the parity standard, it is better than none. Any proposal to eliminate the parity limitation, therefore, might reasonably be accompanied by a proposal for a substitute standard.

A bill under Congressional examination would provide, in the interest of producers and consumers, an orderly flow or disposition thereof to and among the available market outlets throughout the normal marketing season to avoid unreasonable fluctuations in supplies and prices.

Passage of this or a similar amendment which does not mention parity, would complete the process of sterilizing the parity limitation by providing an alternative and more flexible set of criteria. Nevertheless, administrative standards would still be required to replace the legislative parity standard.

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POTATOES

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amination of the tubers at harvest revealed that gibberellin applied to the foliage as late as one week before harvest markedly stimulated sprouting. In comparison, tubers from untreated plants showed little or no sprouting activity.

When the tubers harvested from sprayed plants were cut and planted as seedpieces, the rate of emergence of new plants was accelerated. Most rapid emergence resulted from the earliest application and the highest concentration. similar results were obtained with a summer crop of White Rose potatoes at Davis. Although foliar sprays are reasonably effective in shortening the rest period, high concentrations of gibberellin are required and therefore the method probably has limited practical value.

Immersing resting potatoes for five minutes in a gibberellin solution—from 0.5 to 25.0 ppm—will consistently curtail the rest period and promote sprout growth. However, the commercial significance of these findings must be determined.

The influence of gibberellin on yield and on the processing quality of the resulting tubers is being investigated under a variety of environmental conditions and locations. The effect of the chemical on sprout emergence and plant growth from nonresting potatoes needs to be investigated.

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PLUMS

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sium, the variability of the plots is such that it can not be considered significant. The shape of the seasonal curves—an initial rise rather than a drop—is like that of the apricot rather than like the prune. The potassium values tend to be high.

Potassium content of Santa Rosa Plum leaves, Orchard A, 1956.
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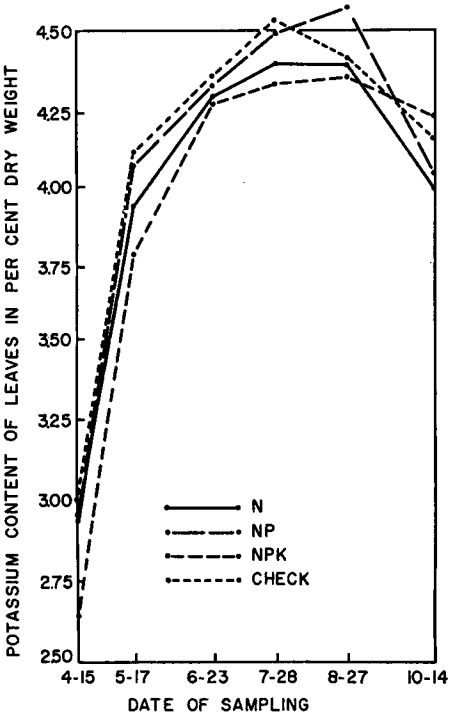
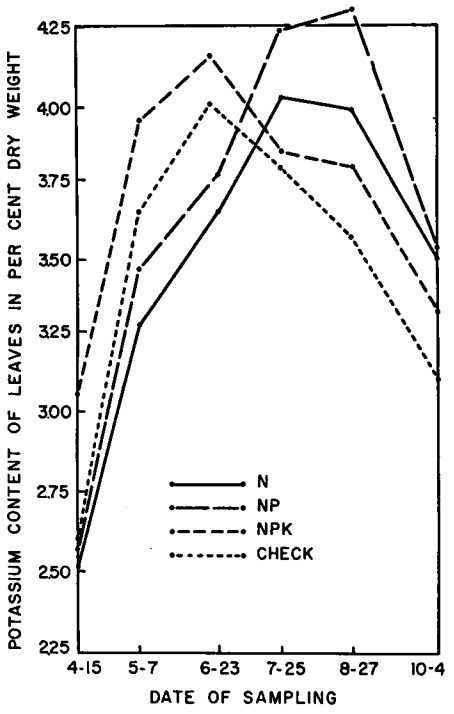


Potassium content of Santa Rosa Plum leaves, Orchard B, 1956.



This may be due to the fact that magnesium levels are low, as are sodium. There is a tendency for a reciprocal relationship between these two elements and potassium. At Davis, for example, the magnesium content has been found to be 2–3 times as high as in the Kern County experimental plots, and the potassium content is much lower.

The leaf analyses provided an obvious explanation of the failure of the trees to respond to nitrogen. The analyses also pointed up the difficulty of getting absorption of phosphorus and potassium—even with heavy applications on a light soil—and emphasized the importance of time of sampling in the interpretation of leaf analyses.

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GRAPES

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ters and berries of vines sprayed with the gibberellin at 5 ppm were larger than those of unsprayed and ungirdled vines, but smaller than those of the unsprayed but girdled vines. Very large clusters and berries resulted from treatment with the compound at 20 ppm and 50 ppm. The percentage of total soluble solids was lowest and the percentage of acid highest in the fruit sprayed with the compound at 50 ppm.

Zinfandel

Grape varieties with compact clusters are undesirable because rot is likely to develop in them. If the cluster parts could be lengthened, such clusters would be loosened and the tendency to rot reduced. Shoots of Zinfandel, a variety with very compact clusters, were sprayed with gibberellin at 0, 1, 10, 100, or 1,000 ppm on April 7 when the shoots were 2″–3″ long. Canes were removed and fruit harvested on September 23. The shoots and their internodes were elongated in proportion to the concentration of compound used. When measured on July 15, the shoots sprayed with the compound at 1,000 ppm were twice as long as the untreated shoots.

The length of cluster parts was increased in proportion to the concentration of the gibberellin used. The compound at 10 ppm resulted in the production of rather loose clusters as a result of the elongation of cluster parts. Very loose clusters resulted from application of the compound at 100 ppm, but there were many shot berries. At 1,000 ppm the clusters were virtually destroyed. In this treatment ovaries still adhered to the greatly elongated pedicels, but the cluster framework was cracked and quite brittle. Above 1 ppm the average weight per cluster and berry usually decreased with increasing concentrations of the compound, probably because the number of small shot berries increased.

There was no definite trend in the percentage of total soluble solids or acid. However, treatments at later dates hastened coloration and maturation.

Data at Harvests for Black Corinth and Thompson Seedless Grapes

Treatment, concentration gibberellin ppm	Av. wt./ cluster gm	Av. wt./ berry gm	Total soluble solids %	Acid %
Black Corinth				
0 not girdled	59.8	0.14	27.7	0.85
5 not girdled	122.0	0.47	23.2	0.85
20 not girdled	215.9	0.65	23.5	0.89
0 girdled	131.7	0.35	24.1	1.02
Thompson Seedless				
0 not girdled	0.66	1.59	22.4	0.79
5 not girdled	0.95	1.91	23.2	0.73
20 not girdled	1.46	2.71	18.9	0.83
50 not girdled	2.15	3.15	17.6	0.94
0 girdled	1.10	2.26	23.0	0.74

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RED MITE

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ated for mite control in an orchard with a history of mite resistance to parathion and malathion. Although the sprays were applied for aphid control, mite counts were taken at intervals throughout the season. All materials were applied with conventional ground equipment and orchard guns, at an average of 350 gallons per acre.

A definite mite resistance to parathion and malathion was observed in past seasons and in 1957 Diazinon did not hold the mites in check. The trees in the test plot showed severe mite injury to the leaves. Thimet, at two dosages, Nialate, and Guthion gave what could be considered commercial control in spite of the phosphate resistance present. However, in the previous season, Thimet gave such good control in this orchard that only a few mites could be found on the treated trees. In the 1957 season, although commercial control was obtained, the plots were close to treatment levels. Guthion and Nialate had not been used previously in this orchard.

Thiodan—the only nonphosphate compound used in these trials—had little or no acaricidal effect.

The results of these tests indicate that even though resistance to one or more phosphate chemicals may be present, it is possible to obtain spider mite control for at least a season or so with other phosphate materials. How long the materials will continue to be effective is a matter of conjecture.

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Gordon Morehead, Sacramento County, Jim DeTar, Solano County, Dick Bethell, El Dorado County, Russell Gripp, Lake County, and Bruce Bearden, Mendocino County; Farm Advisors, University of California, cooperated in trials with Bartlett pears.

PARASITES

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Aphelinus semiflavus adults began to appear commonly in the San Joaquin and Salinas valleys in the fall of 1957. The shiny black aphid mummy is quite distinct, but it is not conspicuous because it is found usually on the under surface of the lower leaves.

In addition to the three imported parasites, over 8,000 individuals of several aphid feeding predators imported from India have been released in northern California. Among these predators are three ladybeetles—*Coccinella septempunctata* Linn.; *Adonia variegata* Goeze; and *Scymnus nubilus* Mulsant. Also from India a green lacewing—*Chrysopa carnes* St.—has been released against the spotted alfalfa aphid. None of these predators had been recovered by November 1957. One of the difficulties in establishing the predators is the effective competition of native natural enemies of the spotted alfalfa aphid in the spring and fall.

Because the three wasp parasites overwintered successfully in the San Joaquin Valley and *Praon* survived the winter as far north as Tehama County, it is expected that they will be widely distributed throughout the state in 1958, and become abundant enough to contribute significantly to the natural control of the spotted alfalfa aphid in northern California as they have done in southern California.

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