

# Planting to Reduce Deer Damage

deer show preference for Sweet Sudan and vetch during tests with green summer forage for sheep

William M. Longhurst

**Deer damage** to plant crops in California is most severe where cultivated lands adjoin deer ranges—particularly in parts of southern California, the coast ranges and the foothills of the Sierra Nevada.

Deer proof fencing and chemical spray repellents have met with some success, but both of these methods are costly in material and labor.

To find a less expensive method of reducing deer damage, two planting tests were carried out during the past year at the Hopland Field Station in Mendocino County. Three strains of Sudan Grass, a planting of oats and one of oat and vetch mixture were tested.

A routine planting of Sudan 23 was made on April 17, 1952, to provide green summer forage for sheep. At one side of this field, two plots of one half acre each were planted, one to Common and the other to Sweet Sudan. Eighty-eight days later, on July 14, just before the sheep were turned in, the accumulated deer use was measured.

Measurements were made on three 100-foot line plots placed at random on each of the three strains of Sudan. A visual estimate of the degree of use was made on the plant closest to each foot mark along a 100-foot tape stretched along each plot. A total of 300 plants of each strain of Sudan were estimated for use. Use was rated as 0 for No use; 1, Light use; 2, Moderate use; 3, Heavy use.

Counts of fecal pellet group density were employed as a cross check. This method has been used with considerable

success by wildlife technicians in recent years to determine distribution of deer use. Through studies on penned deer it has been learned that the average rate of fecal pellet deposition is about 12.7 groups per day. Thus by counting pellet groups on 1/100-acre strips along the line plots an estimate of deer days use could be made.

Measurements of deer use were also made using this pellet group count method on a three-acre planting of Ventura red oats. Approximately one acre of this field was overseeded with common vetch. The planting was made November 6, 1951, and pellet counts were taken at three times, the last on June 11, 1952, just before the field was cut for hay.

Deer utilization of cultivated crops is known to vary markedly in different areas depending on the availability of natural forage, density of the deer population, and competition with domestic livestock.

Deer on the Hopland Field Station are of the Columbian black-tailed subspecies. There is some seasonal movement off the station to higher summer ranges from the latter part of April until the first part

of August. Winter population density was estimated at approximately 80 deer per square mile and summer density at about 20 deer per square mile. Competition for natural forage with domestic sheep is considerable. The Sudan and the oat-vetch plantings were attractive sources of food during periods of natural food shortage so they received an abnormally heavy amount of use.

The numerical ratings for degree of use made it apparent that deer had taken the Sweet Sudan nearly 16 times as heavily as the Sudan 23. Use on Common Sudan was intermediate, averaging slightly over five times as heavy as the Sudan 23.

The pellet group counts had a rough correlation with these use figures. No pellet groups were found in the Sudan 23 plots, but the Common Sudan showed an average of five deer days per acre and Sweet Sudan, 52 deer days per acre.

Since the Common and Sweet Sudan were in one-half acre plots—planted toward the side of some 20 acres of Sudan 23—it is probable that what use did occur on the Sudan 23 was more widely

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Effect of deer use on Sudan Grass. Foreground—Sweet Sudan, background—Sudan 23.



Sudan Grass Plots					
Plot number	Sudan strain	Date examined	No. of plants measured	Deer use	No. of fecal pellet groups per acre
1	23	7-14-52	100	5	0
2	23	7-14-52	100	7	0
3	23	7-14-52	100	4	0
<b>TOTAL</b> .....			<b>300</b>	<b>16</b>	<b>0</b>
<b>AVERAGE</b> .....				<b>0.05</b>	<b>0</b>
4	Common	7-14-52	100	51	100
5	Common	7-14-52	100	8	100
6	Common	7-14-52	100	18	0
<b>TOTAL</b> .....			<b>300</b>	<b>77</b>	<b>200</b>
<b>AVERAGE</b> .....				<b>0.26</b>	<b>66</b>
<b>5.19 Deer Days per Acre</b>					
7	Sweet	7-14-52	100	25	100
8	Sweet	7-14-52	100	98	600
9	Sweet	7-14-52	100	112	1300
<b>TOTAL</b> .....			<b>300</b>	<b>235</b>	<b>2000</b>
<b>AVERAGE</b> .....				<b>0.78</b>	<b>666</b>
<b>52.44 Deer Days per Acre</b>					

Deer use was rated numerically on individual plants: No use = 0, light use = 1, moderate use = 2, heavy use = 3.

One deer day = 12.7 Fecal pellet groups.

In olive plants, lot sizes of less than 1,000 pounds—25% of actual lots fell in this category—would mean time losses of over 40% in typical plants. Average lots of 3,000 pounds would mean an average loss of 15%. Very large lots can be handled efficiently, with average time losses approaching 2%.

### Costs

The major impact of the separate-lot system on plant operating costs is caused by the loss of effective working time, and by the resulting reduced volume of fruit handled per hour. In most plants, the elimination of the separate-lot system would permit only minor changes in the working force—grower-tally girls for packed fruit could be eliminated in fresh-fruit packing houses, and the number of men weighing and handling graded and sized olives could be reduced in some olive plants.

The lower table on page 14 summarizes data on plant volumes and estimated direct labor costs for the apple, pear, and olive plants included in the study. This table shows that the elimination of the separate-lot system would result in increases in the potential plant volume per hour. The volume increases would be small where the present system results in small reductions in effective working time, and large where present time losses are large. Most plants would be able to reduce the direct labor payroll per hour, although these changes would be relatively minor. The combined influence of direct labor reductions and increased volume per hour would be reductions in average direct labor costs—exclusive of packing labor and other piece-rate workers—ranging from \$0.13 to \$1.09 per thousand pounds of apples or pears, and from \$0.30 to \$0.80 per thousand pounds of olives. These costs of the separate-lot system may not seem large but they may be quite significant in terms of the total volume of fruit handled by a plant in any season. Moreover, the range in costs emphasizes that many plants can improve efficiency and reduce costs by adjusting their separate-lot systems in order to minimize the loss in effective working time.

*A subsequent part in this series will deal with the sampling system—the second system used in California fruit-packing and processing houses to account to growers for products received. This part will also compare plant costs under the separate-lot and sampling systems to determine the particular method most economical under varying conditions.*

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## DEPRECIATION

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record aids in farm management and accounting and is almost a must for farm income tax reporting. The table on page 6 lists the usual lives and depreciation rates for certain groups of depreciable farm assets.

In accounting for income tax purposes, farmers have the option of considering certain development costs as current expense or as capital outlay to be spread over the useful life—of an orchard, for example—in the form of depreciation. There is a clear-cut line between what is actually a capital outlay for an improvement—or piece of equipment usable over a period of years—and what is maintenance or repairs chargeable as current expense.

Not all capital outlay is for a depreciable asset. The original leveling of land is a capital outlay considered to be permanent and not to be written off in the form of depreciation. However, releveling to restore land to its previously level

condition can be considered as current expense. Where releveling goes beyond that and results in a better job than the original, it becomes, in part, an additional capital outlay and should be so divided.

A capital and depreciation record should provide for the listing by groups of all individual depreciable farm assets. Such a listing should show age, year acquired, original cost, subsequent additional capital outlay, prior depreciation, and for each year the remaining value, added capital, estimated remaining life and depreciation for the year. With such a listing for any requested inspection only group totals need be inserted in the Farm Schedule for Income Tax.

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*The California Farm Record Book contains model forms of capital and depreciation records, inventories and net worth statements. It may be obtained for \$1.00 from Agricultural Publications, 22 Giannini Hall, University of California, Berkeley 4, or from the local office of the Farm Advisor.*

## DEER

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dispersed. Therefore, the figures obtained from the plots were not strictly comparable. However, it is significant that deer actually had to pass through Common Sudan or Sudan 23 to reach the Sweet Sudan.

Deer use on the planting of oats and the oat-vetch mixture was heaviest during the midwinter and spring months. Pellet group density checks indicated relatively little difference in utilization until the late spring period after the middle of April. Then as the oats matured there

was a definite shift to the end of the field containing vetch. Deer preference for legumes at this season and into the summer is well known.

These tests are not precise, but they do indicate that it is possible to plant certain crops relatively less attractive to deer than are other similar crops.

Sudan 23 is known to be less palatable for livestock than Sweet Sudan but it produces up to 25% more feed than other strains. This together with its low palatability for deer make it a good choice.

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Oat and Vetch Plots

Plot no.	Planting	Date checked March 12, 1952	Date checked April 11, 1952	Date checked June 6, 1952
		Pellet groups per acre	Pellet groups per acre	Pellet groups per acre
1	Oats	1800	300	200
2	Oats	2500	100	1100
3	Oats	3700	100	300
<b>TOTAL</b> .....		<b>8000</b>	<b>500</b>	<b>1600</b>
<b>AVERAGE</b> .....		<b>2667</b>	<b>167</b>	<b>533</b>
<b>Days</b> .....		<b>127</b>	<b>30</b>	<b>61</b>
<b>Deer Days Per Acre</b> .....		<b>210</b>	<b>13</b>	<b>42</b>
<b>Deer Days Per Acre Per Day</b> .....		<b>1.57</b>	<b>0.43</b>	<b>0.69</b>
4	Oats and Vetch	1900	300	1600
5	Oats and Vetch	1700	200	1400
6	Oats and Vetch	2200	200	700
<b>TOTAL</b> .....		<b>5800</b>	<b>700</b>	<b>3700</b>
<b>AVERAGE</b> .....		<b>1933</b>	<b>233</b>	<b>1233</b>
<b>Days</b> .....		<b>127</b>	<b>30</b>	<b>61</b>
<b>Deer Days Per Acre</b> .....		<b>152</b>	<b>18</b>	<b>96</b>
<b>Deer Days Per Acre Per Day</b> .....		<b>1.19</b>	<b>0.60</b>	<b>1.58</b>

One deer day = 12.7 Pellet groups.