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DOUBLE CROPPING DRY PEAS AND FORAGE IN SOUTHERN IDAHO

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Dry peas grown as a cash crop in southern Idaho are usually harvested by the first of August, which leaves the land bare and unproductive for the last third of the growing season, unless the peas were used as a nurse crop to establish alfalfa. This raises the question: Could August, September and the early part of October be utilized for forage production from plants other than alfalfa?

The quality of this part of the growing season is shown in Figure 1. The three solid curves give the average degree days with a base 50°F, for three locations in southern Idaho, (a day with average temperature of 57°F would be counted as 7 degree days, since the average was 7° above the 50°F base). The two dashed curves show the degree-days at Twin Falls in 1969 and 1970.

Although the development of plants depends on many factors, such as weed management, soil moisture, soil fertility, day length and temperature extremes, most plants must have maximum temperatures above 50°F to make significant growth. Thus, with other factors equal, the larger the number of degree days during the growing period, the greater the potential production.

Of course, the number of degree days in the fall is of little value for plant growth if the plants have been severely damaged by frost. The two marks on each of the solid curves indicate the expected date for fall frost. The first mark indicates the date, in one year out of ten, by which a 28°F minimum air temperature will have occurred. The second mark indicates the date with a 50-50 chance of the 28°F low having occurred.

Most frost-senstive plants, such as corn, sorghum and potatoes, will be severely damaged when air temperatures fall to 28°F or below. More tolerant plants, such as grain, alfalfa, peas and beets, will continue to grow during the warmer part of the day, even though light frost occurs at night.

By the end of October, the night temperatures across southern Idaho dip into the low 20's, which, combined with the short, cool days, essentially halts the growth of even the more hardy plants.

FIELD TESTS

To demonstrate the forage production potential of the last third of the growing season, several field tests were made near Twin Falls. Following the harvest of a pea field in 1969, three hybrid crops — corn, sorghum, and Sudangrass — were planted and irrigated up to the first week in August. As shown in Fig. 1, the 1969 season was warmer than average; killing frost did not occur until October 3. Forage production from the Sudangrass and sorghum was disappointing; however, the corn in the best portions of the field with a population of 40,000 plants per acre produced nearly 3 tons of dry matter per acre.

Based upon these preliminary results, a second study was initiated during the 1970 growing season. The experimental site was fertilized with phosphorus in the fall of 1969. On March 25, 1970, one pint per acre of treflan was disked into the soil and the field was subdivided to accommodate six different treatments, each replicated three times (Table 1).

Four of the treatments were planted to peas, one to peas and 20 pounds of alfalfa per acre, and one to peas and approximately one pound of turnips per acre. All peas were planted at 190 pounds per acre with a grain drill, using an alfalfa attachment for the alfalfa and turnip seeds. The field was then corrugated on 24-inch centers.

A good stand resulted, and the entire area was uniformly irrigated according to the best available recommendations for dry pea production. At the end of July, the field was cut with a swather and the peas harvested with a combine.

The yield of dry peas averaged 28.6 sacks per acre from the pure stand of peas, 28.2 sacks per acre from the pea and alfalfa mix, and 24.5 sacks from the pea and turnips mix. Pea yields of 28 to 30 sacks per acre for the 1970 growing season in the Twin Falls area were considered acceptable, since the weather conditions were not particularly favorable for dry pea production and a hail storn near the end of July shelled out about a sack per acre.

Figure 1. The degree days, base 50°F, for three locations in southern Idaho (solid lines) and for individual periods in 1969 and 1970 (dashed lines) near Twin Falls. The average number of degree days for the whole growing season in the Twin Falls area is around 2,200.

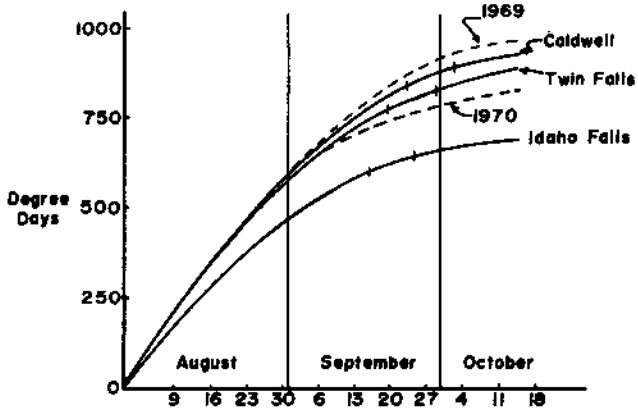

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Table 1. Yields and nitrogen status of forage crops. Planting was done August 1, with the exception of alfalfa and the first group of turnips, which were seeded with peas in March. Yields are averages from three plots and include both tops and roots in the case of turnips.

Crop	Harvest date	Wet weight	Oven dried weight	Nitrate	Total nitrogen	Nitrogen in forage
		— tons/acre —		%	%	lbs./acre
Corn + peas	9/18	5.1	1.1	0.30	2.5	40
Alfalfa	10/13	5.4	1.5	.25	2.3	69
Wheat + peas	10/13	5.1	1.2	.18	2.7	65
Second crop peas	10/19	7.9	1.7	.34	2.9	98
Turnips (March)	10/20	13.9	2.3	.13	1.5	69
Turnips (August)	10/20	14.7	2.7	.20	1.7	92

In addition to the information on yields and nitrogen analyses shown in Table 1, the following items should be noted:

(a) The peas were all volunteer from seed left on the surface after combining. Peas germinated and grew well with the wheat and corn, but did not appear in the turnips or alfalfa. The average yield for second-crop peas came from three border areas with the thickest volunteer stands, thicker even than one would plant for dry pea production.

(b) Yields were measured on an oven-dried basis, which are lower than field-dried values. For example, the field-dried yield of alfalfa was 1.9 tons per acre, while the oven-dried yield was 1.5 tons.

(c) The turnips were all infested with maggots. Those planted with peas in March lost most of their tops to aphids in September. Those planted in August generally had healthy tops at harvest, but the largest roots were only 1 or 2 inches in diameter, even though they were planted at the low rate of about 1 pound per acre.

(d) The corn was planted to give 60,000 plants per acre. Hybrid seed was not used because of its greater cost, and because there would not be time for ears to form. The plants were between 2 and 3 feet tall at the end of the growing season. The lower yield in 1970, compared to the maximum of 3 tons produced in 1969, was primarily a result of fewer degree-days and cold temperatures that ended most of the corn's growth by September 14 (Fig. 1).

On August 1, 60 pounds per acre of nitrogen were applied to the field, and the four bare plot areas were disked and planted to the forage crops shown in Table 1. The crops were planted with a grain drill and alfalfa attachment. The residual alfalfa and turnips on the two remaining plot areas were not disturbed. The field was furrow irrigated twice in August and once in September.

CONCLUSIONS

The results in the table and the climatic data in the figure show some potential for forage production from cool season plants following the harvest of dry peas. The area of most promise extends from the Twin Falls region on west to the Oregon border. Lower second-crop yields can be expected to the east of Twin Falls because of the rapidly decreasing length of growing season.

Alfalfa seeded with peas is already utilized for double cropping. Although alfalfa did not reduce the yield of dry peas during the 1970 season, success of the operation depends upon removal of the pea crop before the alfalfa makes significant regrowth in the early part of August. Turnips should not be planted with peas, as they reduce dry pea yields.

If pea fields are to be planted to a forage crop after the pea harvest, then cool season plants such as peas, a pea and grain mix, or turnips may be considered.

Corn and related plant species are not the best choices to follow peas because of the possibility of frost and cool weather in September. However, corn planted to produce stands of 40,000 to 60,000 plants per acre might be considered for fields on which crop failure occurred in June or early July as a result of an unseasonable freeze or a severe hailstorm.

RECOMMENDATIONS

As the yields reported in Table 1 are for a single growing season, and since no feeding trials were conducted, specific recommendations would be premature. However, the results indicate the potential production of forage following peas in southern Idaho. If any of the crops would be useful in your farm or ranch operation, try them on a limited basis the first year to gain some management experience in growing the crops and in feeding the resulting forage.

(For additional information on feeding the forages shown in Table 1, see **Feeds and Feeding**, by F. B. Morrison, Morrison Publishing Co., Ithaca, N. Y., 1954.)

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