SPECIALIZED cropping in both intensive and extensive proportions is common practice in western agriculture. The three general classes of farming consist of grazing, dry land farming, and irrigation farming. Using the 1940 federal census figures for the Pacific Coast states of California, Oregon, and Washington as a fair sample of agriculture in the far West it is found that of more than 63 million acres in farms about 32 million acres are used for grazing, about 19 million for crop land, and the remaining for plowable pasture and woodland.

GRAZING LAND

No fertilizers are applied to the land used for grazing. Overgrazing is the chief menace to the productivity of these lands, for it results in the gradual destruction of the native perennial grasses, depriving the soil of its most valuable vegetative cover, and exposing it to severe deterioration by erosion. The war demands for increased livestock production will have a tendency to accelerate overgrazing and although the consequent reduced production of livestock feed will have no appreciable effect on the nitrogen problem in so far as the grazing lands are concerned, the loss of feed thus sustained will have to be made up by feed produced on cultivated soils. The additional drain on the cultivated lands by the production of this extra feed will call for large quantities of nitrogen which will have to be provided by the soil, by commercial nitrogen, and by symbiotic nitrogen fixation. Despite the temptation to utilize the grazing lands to the limit of their capacity in order to satisfy the demand for increased livestock production, overgrazing must be avoided not only because excessive grazing causes the destruction of native grasses and increased erosion, but also because it will result very definitely, although indirectly, in the utilization of large quantities of the limited supplies of commercial nitrogen now available for agriculture.

DRY LAND FARMING

Dry land farming is practiced on approximately 13 million acres in the Pacific states. The major part of this land receives less than 18 inches of rainfall annually. Small grains, with wheat as the major one, constitute the principal crops which are produced generally on summer-fallowed fields in alternate years. Moisture rather than nitrogen is a limiting factor in yields, and nitrogen fertilizers are not used in any significant amounts in this system of cropping. Consequently, the nitrogen problem is not affected appreciably by the production of these crops.

In those dry land farm areas where the annual precipitation is more than 18 inches annually, annual cropping is practiced to a considerable extent. Nitrogen rather than moisture is a limiting factor in yields in this area that approximately 120,000 acres of dry peas are produced annually. A common practice is to grow peas and wheat in alternate years. Results of 20 years of experimental work at this station show that the amount of nitrogen fixed by the peas is sufficient for their growth and the loss of nitrogen from the soil is less under this system of cropping than under the alternate wheat and summer fallow system. Thus, the nitrogen problem on the acreage where peas and wheat are produced in alternate years is handled satisfactorily. However, this acreage covers only a relatively small part of the dry land farming area in the rainfall belts of 18 inches or more. Nitrogen is becoming an increasingly limiting factor in crop yields in the remaining part. Sweet clover has been produced successfully as a green manure crop and is becoming more popular. Nitrogen in the form of commercial fertilizer is needed to maintain yields of grain crops. The nitrogen supply in the soil is maintained by the occasional production of sweet clover or other suitable legumes for green manuring. By careful application of the foregoing practices the large acreage used for dry land farming in the far West will not add to the nitrogen problem.

IRRIGATION FARMING

While the nitrogen situation pertaining to the farm land used for grazing and dry land farming is not serious and can be solved without difficulty, that in relation to irrigated farming is more complicated. Nearly 6 million acres of crop land, excluding the grazing lands, are used for irrigated farming in the far West.