

ANNUAL PHOSPHORUS INJECTION IN IMPERIAL VALLEY

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The recent low prices of alfalfa hay has caused many growers to try to cut production costs by applying phosphorus as efficiently as possible. Growers are taking alfalfa stem samples prior to mowing to tell them whether or not they need to apply any phosphorus. If stem samples are above 750 ppm PO_4-P at 1/10 bloom (when regrowth is one to two inches in length) no phosphorus is required. One composite sample per 70-acre field taken in four quadrants will usually be sufficient to make a decision. However, four samples taken in four areas of the field will give greater confidence in the results. Leaves should be stripped from each stem while fresh then cut the upper and lower 1/3 of the stem off. Air dry or oven dry at 160°F. Take the sample to a local laboratory and ask for PO_4-P analysis

Soil samples may also be used to determine if phosphorus should be applied. This should be done during the fall months. One composite sample will give fair information from four quarters of the field. However, it is much better to divide the field into four quarters and take ten samples per quarter for each 20 acres. When the soil $P(HCO_3)$ level is below 10 ppm, a response is possible; when over 20 ppm, a response is not likely.

Once it has been determined that phosphorus is needed, then it is necessary to determine which method of application and source of phosphorus to use. Fall applications of P_2O_5 are by far the best time to apply annual applications. Sources normally applied are 11-48-0 or 0-45-0 topdressed or injected. Water run applications of phosphoric acid and 10-34-0 are also used.

A fertilizer trial to evaluate phosphorus effects (methods of application and rates) is in progress in the Imperial Valley. The first year's data show a five percent yield increase from 100 lbs/acre P_2O_5 injected vs 100 lbs/acre P_2O_5 topdressed. Normally 100 lbs/acre P_2O_5 is considered to be sufficient for an annual application. The data support this conclusion as there was only a small increase with the injected or topdressed application of the higher 300 lbs/acre P_2O_5 rate. An 11-48-0 source was used for both the topdress and injection treatments. The materials were applied on a four-year old Mesa Sirsa alfalfa stand on September 8, 1976. The soil was Holtville clay loam located at Wisteria 3, gate 50B. The injected treatment had shanks which placed the 11-48-0 in bands 4 inches deep and 10 inches apart.

Fresh yield expressed as a percent of the check and the PO_4-P levels in the midstem on June 13, 1977.

Treatment	Fresh yield expressed as percent of check	Midstem ppm PO_4-P 6/13/77
0 injected	102	930
100 lbs/acre P_2O_5 injected	111	1090
300 lbs/acre P_2O_5 injected	116	1330
0 topdress	100	970
100 lbs/acre P_2O_5 topdress	106	1000
300 lbs/acre P_2O_5 topdress	114	1060

The fresh weights were based on seven cuttings, each treatment was replicated five times.

Summary

If soil and tissue analysis show high levels of phosphorus then obviously no phosphorus should be applied. However, if low levels appear then phosphorus should be applied and this can be any time of year. The most efficient use of phosphorus comes during the fall months and recent trials in the Imperial Valley indicate injecting to be more efficient than top-dressing.