GRASS-LEGUME mixtures are more widely grown in regions of temperate climate than either grasses or legumes alone, since legumes such as alfalfa are susceptible to winterkilling, while grasses grown alone have a relatively high requirement of nitrogen fertilizer. Because of interspecies competition for nutrients in grass-legume mixtures (2, 6, 7, 12, 13) special attention must be paid to fertilization practices if a favorable species balance is to be maintained. Several investigators (1, 2, 3, 8, 15) have shown that nitrogen and potassium are particularly important in maintaining a desirable balance.

In this investigation, nitrogen and potassium were studied at different rates of application on alfalfa, bromegrass, orchardgrass, and timothy grown alone and as alfalfa-grass mixtures. The effects of the treatments on single species are reported in a separate paper (11) but are used herein to evaluate certain competitive relationships.

The objective of this experiment was to study the effect of N and K on the yield, botanical composition, competition for space and competition for nutrients in three alfalfa-grass mixtures.

MATERIALS AND METHODS

The experiment was conducted in the greenhouse from May to October 1962. Daylength was maintained with 300-watt incandescent reflector flood lamps and maintained at a height of 24 to 30 inches above the foliage. 'Cayuga' alfalfa (Medicago sativa), 'Saratoga' bromegrass (Bromus inermis), 'Frode' orchardgrass (Dactylis glomerata) and 'Climax' timothy (Phleum pratense) were used in this study.