

GODFREY, LARRY D.¹, CHRISTINA L. ALEXANDER¹, CHERYL A. WEBER¹, & PEGGY A. MAUK², ¹Dept. of Entomology, Univ. of California, Davis, CA 95616, and ²Univ. of California, Coop. Extension-Riverside Co., Moreno Valley, CA 92557. Influence of Beet Yellows Virus Infection on Fall and Spring Yield of Sugar Beets and on the Production of Viruliferous Bean Aphids.

The management of beet yellows closterovirus (BYV) in California largely depends on the use of several beet production districts, which attempt to temporally and spatially separate older (potentially infected) plantings from new plantings. In recent years to facilitate management of this serious disease, it was recommended that infected spring plantings, that could potentially be overwintered, be harvested in the fall. This would reduce the virus sources and mitigate virus movement by aphids the following spring. The threshold virus infection level for fall harvest was needed to implement this system and depended on 1.) the influence of percentage virus infection on sugar beet tonnage increase during overwintering and 2.) the influence of percentage virus infection on the production of viruliferous aphids in the spring. Field plots were set up in May 1995 and 1996 with BYV infection levels ranging from 0 to 100% in increments of 25%. Target infection levels were achieved by systematically infesting 3-week old beet seedlings with viruliferous green peach aphids. Actual virus infection levels were determined with ELISA. Yields were evaluated in October and again the following April. In October 1995 and 1996, beet yields were reduced by 26.1 and 49.7%, respectively over the 0 to 100% infection treatments. Overwintered sugar beet yields (April 1996) increased by ~10 t/a in the 0-75% treatments (actual infection=2.9 to 38.6%) compared with only 3.5 t/a in the 100% treatment (actual infection=58.5%). Studies to determine the influence of field percentage virus infection on production of viruliferous bean aphids are underway.