



Figure 2. The change in apparent photosynthesis and photorespiration over time using four wild gourd varieties.

CASSAVA: A POTENTIAL FORAGE AND STARCH CROP FOR ARIZONA

by:

J. O. Anderson, C. W. Lee and D. L. Johnson

SUMMARY

Cassava, normally considered a tropical crop, shows considerable potential as a low "input" forage and food crop for the Southwest. Cassava has been successfully cultivated in the Tucson area with respectable yields. The primary limitation to the cultivation of Cassava appears to be a lack of cold tolerance. However, cold tolerance may be found in wild relatives of Cassava which are native to Arizona.

Cassava is grown world-wide as a food and forage crop, present in the diets of approximately 400 million people. Thus, Cassava is second only to the sweet potato as a major food crop.

Cassava's probable center of origin is thought to be Brazil. Thus Cassava is normally considered a tropical crop ill-adapted to the climate of the United States. However, wild relatives of Cassava are native to Arizona, capable of growing at extreme temperatures under natural rainfall conditions. In addition, Cassava exhibits some drought tolerance and has the ability to grow and yield well on a wide range of soil types with low fertility.

Preliminary attempts to grow commercial strains (developed in South America) of Cassava in Arizona, have been successful on a small scale (see Table I).

TABLE I.
SUMMARY OF CASSAVA VARIETY YIELD-TEST DATA

Selection	Tuber X tuber/ plant	Tuber X yield lb/plant	Projected Yield Tuber Ton/Acre	Projected Yield Starch* Ton/Acre	Forage X Yield lb/plant	Projected Yield Forage Ton/Acre	Total Biomass lb/plant	Projected Total Biomass Ton/Acre	Dry Matter lb/plant	Projected Dry Matter Ton/Acre
M. Ven 218	6.5±1.9	2.4±1.0	17.8	5.7	2.7±1.3	20.	5.1 ±2.3	38.	1.0	7.41
M. Col.22	11.3±5.4	3.1±0.9	23.0	7.4	3.9±1.0	29.	7.0±1.9	59.	1.48	11.0
CMC 40	6.3±2.3	2.9±1.3	21.5	6.9	5.4±2.4	40.	8.3±3.7	61.5	1.80	13.3
M. Mex 59	5.8±2.3	1.42±0.7	10.5	3.4	7.0±2.5	52.	8.42±3.2	62.4	2.2	16.3
MITA 1158	9.0	2.8	20.7	6.6	12.3	91.	15.1	111.	3.9	28.8
LANERA	5.0	1.5	11.1	3.5	5.5	41.	1.6	12.	1.7	12.6

Planting density was one plant/square meter, projected to 6,000 plants/hectare or 2,400 plants/acre.

Irrigation was 30 inches; the growing season, 8 months.

* tuber starch content = 32% (fresh peeled tuber)
tuber moisture content = 93%
forage moisture content = 70%

The forage and tuber yields were reduced, but respectable, considering the radical differences in environment. Commercial production of Cassava in the Southwest is envisioned to be a low energy "input" crop (requiring little fertilizer, water, and "less than ideal" crop land) with a high "output" of forage (suitable for animal feed) and starch (for food or local conversion to ethanol).

The primary limitation to Cassava cultivation appears to be a lack of cold tolerance in the wild relatives of Cassava which are native to Arizona and Cassava may overwinter satisfactorily in the Yuma area. If an overwintering Cassava cultivar could be developed for the Southwest, Cassava could be cultivated as a multiple-cutting forage crop with tubers being harvested on alternate years.

Cost of Producing Forage and Grain in Arizona

Dr. Scott Hathorn Jr., Extension Economist

Alfalfa hay production in Arizona is concentrated in two counties--Maricopa and Yuma--where 75 percent of the crop was produced in 1980 (see Table 1). In 1980 Arizona produced 1.115 million tons of hay on 165,000 acres for an average yield of 7.0 tons per acre. Comparing 1980 data with that for the 1972-76 period average, acreage decreased about 23.2% and the yield per acre increased slightly from 6.6 tons to 7.0 tons.

Wheat production is concentrated in Maricopa, Pinal, and Yuma Counties where 91 percent of the 1980 crop was produced. Arizona produced 516,000 tons of wheat in 1980 on 215,000 acres with an average yield of 2.40 tons per acre. Compared with 1972-76 five year average, 1980 Arizona wheat acreage declined 14 percent.

Maricopa and Pinal Counties are the principal producers of barley, producing 77 percent of the total crop in 1980. Total production in 1980 was 94,800 tons on 50,000 acres with an average yield of 1.90 tons per acre. Barley acreage in 1980 was down 35 percent from the 1972-76 average.

Sorghum grain is produced primarily in Cochise, Graham, Maricopa and Pinal Counties where 74 percent of the 1980 crop was produced. Arizona produced 54,600 tons of grain sorghum in 1980 on 26,000 acres with an average yield of 2.10 tons per acre. Compared to the 1972-76 average, the acreage devoted to grain sorghum declined 76 percent in 1980.

Although corn is produced in several counties with Cochise County as the principal producer, in Arizona it ranks second in order of production below wheat.