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Production Manual Update
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Interim Fertilizer Recommendations for Wet (Flooded) Taro

The recommendations given here are intended to assist commercial taro growers to improve fertilizer programs for wet (flooded) taro and help increase yields, avoid excessive fertilizer applications and costs, limit disease severity resulting from overfertilizing with nitrogen, and reduce environmental pollution. These are "interim" recommendations because they are subject to refinement as more information becomes available.

This information is intended to be used in conjunction with the best-management practices given in *Taro, Mauka to Makai; A Taro Production and Business Guide for Hawai'i Growers*, available from CTAHR. Updates to this information will be announced and made available on the Internet website <www.ctahr.hawaii.edu/taronexus/taronexus.htm>. Computers to access the Internet are available at many public library branches.

To use these recommendations, a laboratory analysis for soil pH and soil levels of the nutrients P, K, Ca, and Mg must be done on soil samples from the *lo'i* early enough so that the results can be available and fertilizers can be mixed into the soil before planting. Send the samples for analysis to a commercial laboratory or the CTAHR Agricultural Diagnostic Service Center. Caution—different laboratories may use different analysis methods. The soil analyses for K, Ca, and Mg must be done with ammonium acetate extractant; P analysis must be done with the modified Truog method. Fertilizer recommendations given here are not appropriate for soil data obtained with other extraction methods.

After planting, leaf tissues must be periodically sampled and analyzed to monitor the crop's nutrient status. Based on these analyses, apply supplemental fertilizer if needed.

Fertilizer recommendations are given as simple fertilizers rather than as complete fertilizers (blends). Use of simple fertilizers allows flexibility in providing the nutrients needed without overapplying other nutrients. Fertilizer levels are given in pounds or tons per acre.

Abbreviations

>	greater than
<	less than
≤	equal to or less than
≥	equal to or greater than
Ca	calcium
$CaCO_3$	calcium carbonate
Mg	magnesium
$MgSO_4$	magnesium sulfate
N	nitrogen
P	phosphorus
P_2O_5	phosphate
K	potassium
K_2O	water-soluble potassium
ppm	parts per million
ton	2000 pounds (lb)
mo	month

Preplant fertilizer applications based on soil analysis

Compare your soil analysis results to the ranges given in left column of the following sections, and read across to the fertilizer recommendation. These fertilizers should be applied and tilled into the soil before planting.

Soil pH and calcium

pH > 5.8,	Ca > 2000 ppm	do not apply $CaCO_3$
pH < 5.8 but > 5.5,	Ca < 2000 ppm	1 ton $CaCO_3$
pH < 5.5,	Ca < 2000 ppm	2 tons $CaCO_3$
pH > 5.8,	Ca < 2000 ppm	1 ton gypsum

Soil phosphorus

> 75 ppm	do not apply P_2O_5
< 75 ppm but > 30 ppm	100 lb P_2O_5
< 30 ppm	200 lb P_2O_5

Soil potassium

> 200 ppm	do not apply K_2O
< 200 ppm	200 lb K_2O

Soil magnesium

> 400 ppm	do not apply $MgSO_4$
< 400 but > 200 ppm	100 lb $MgSO_4$
< 200 ppm	200 lb $MgSO_4$

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Fertilizer applications during the first 3 months

After the *huli* are planted, monthly applications of N and K fertilizers can be made if needed. Fertilizer recommended during the first 3 months is as follows:

1 month	25 lb N as urea, plus 50 lb K_2O if soil K was < 200 ppm
2 months	25 lb N as urea; 50 lb K_2O
3 months	50 lb N as urea; 50 lb K_2O

Monitoring the crop with leaf tissue analyses

Leaf tissue analysis samples should be taken from the *lo'i* at 3 months and 6 months after planting to adjust the amounts of N, K, Ca, and Mg applied to the crop. If leaf analysis levels are low, more fertilizer is needed. The recommendations given here are designed to ensure that the crop gets a total of approximately 300 lb of N and 400 lb of K_2O from the soil or fertilizers. It is assumed that the crop's need for P is met by the preplanting fertilizer application.

At 3–4 weeks after the second fertilizer application and before the third fertilizer application, take a leaf sample consisting of the most recently matured leaf from about 10 plants. This leaf is usually leaf number 3 or 4, counting the newest or emerging leaf as leaf number 1. Send the sample for analysis to a commercial laboratory or the CTAHR Agricultural Diagnostic Service Center. When the analysis results are received, make fertilizer applications based on the following sections. At 3–4 weeks after the fifth fertilizer application and before the sixth one, take another leaf sample. All fertilizer applications after 6 months will be based on the analysis of this sample.

Post-planting fertilizer application levels (per acre) based on leaf tissue analysis

Leaf nitrogen

> 4.2%	do not apply N
< 4.2% but > 3.8%	20 lb N at 4 mo, 30 lb at 5 mo, 40 lb at 6 mo
< 3.8% but > 3.4%	40 lb N at 4 mo, 50 lb at 5 mo, 60 lb N at 6 mo
≤ 3.4%	60 lb N at 4 mo, 60 lb at 5 mo, 60 lb at 6 mo

Leaf potassium

> 4.0%	do not apply K_2O
< 4.0% but > 3.5%	30 lb K_2O at 4 mo, 40 lb at 5 mo, 50 lb at 6 mo
≤ 3.5%	75 lb K_2O at 4 mo, 75 lb at 5 mo, 75 lb at 6 mo

Leaf calcium

> 0.8%	do not apply gypsum
< 0.8% but > 0.6%	100 lb gypsum at 4, 5, and 6 mo
< 0.5% but > 0.4%	150 lb gypsum at 4, 5, and 6 mo
≤ 0.4%	200 lb gypsum at 4, 5, and 6 mo

Leaf magnesium

> 0.30%	do not apply $MgSO_4$
< 0.30% but > 0.25%	100 lb $MgSO_4$
≤ 0.20%	150 lb $MgSO_4$

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