



**HELICONIA SOCIETY INTERNATIONAL  
CONFERENCE 2012**

**Heliconia 'Golden Torch'  
macronutrients Deficiency**

**Ana Cecilia Ribeiro de Castro**

# Objective

- Characterize nutritional deficiencies in *Heliconia* “Golden Torch”, through growth indicators, symptomatology and macronutrients contents in leaves and underground plant part

*Heliconia psittacorum*

# Material e methods

FLORICULTU  
TROPIC

- Rhizomes planted in sand irrigated with water
- complete nutrition solution (N, P, K, Ca, Mg, S + micro)
  - solutions with individual nutrient (N, P, K, Ca, Mg or S) omission
  - solution lacking all nutrients
- Daily irrigated, volume of solution equivalent to the pot capacity until obtaining drained liquid

*Heliconia psittacorum*

# Material e methods

FLORICULTU  
TROPIC

- All the shoots were weekly identified and, in the same occasion, evaluations were done, analyzing nutritional deficiency by description of the visual symptomatology
- growth indicators: emitted shoot number, leaf number, leaf area
- 1<sup>a</sup> harvest: 90 days after the treatments vegetative phase,
- 2<sup>a</sup> harvest: 150 days: floration

*Heliconia psittacorum*

# Material e methods

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TROPIC

- Plants were individually washed in water and leaves and underground part
- dried at 70oC, until constant weight. Then, dry mass was determined to each plant part.
- first shoot: leaves (first, second and third, completely expanded, numbered from the apex) and underground plant part (roots and rhizome)

*Heliconia psittacorum*





# Visual symptoms

- visual nutrient deficiency symptoms appeared in the following occurrence order: N, Mg, K, P and S
- Third leaf presents lower nutrients contents

# Visual symptoms

- N omission: presented generalized chlorosis starting in the older leaves
- **Reduction:**
  - number of emitted shoots (3,8-9,4),
  - leaf dry mass production (28,7- 83,6), and the underground (31,9-64,5),
  - leaf number (20,6-31,60)
  - leaf area ( 217,5- 299,1 cm<sup>2</sup>)



*Heliconia psittacorum*

# Visual symptoms



- P omission: chlorosis being observed, older leaves
- **reduction** on shooting (4,0-9,4),
- leaf number (20,2-31,6)
- leaf area (256,2-299,1),
- Leaf dry mass (33,1-83,6)
- Underground dry mass (51,5-64,5)

*Heliconia psittacorum*



# Visual symptoms

FLORICULTURA  
TROPICAL



- K omission: dark-green color in all the leaves, apical necrosis in the older and leaves with more evident leaf veins, resembling a chartaceous texture
- No decreases in shooting (10,6-9,4) and dry mass production of leaves and underground plant part.
- An increase in leaf number (36,0-31,6) compared to plants treated with complete solution, but a reduction in leaf area occurred

*Meliconia psitacorum*

# Visual symptoms



- Ca omission: not visible
- no significant decrease occurred neither in shooting, dry mass production of leaves and underground part,
- Leaf number and leaf area were higher when compared to the treatment with complete solution,

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# Visual symptoms



- Mg omission: plants presented marginal chlorosis in the older leaves and necrosis in the leaf blade borders and in the leaf apex
- no significant differences in shooting and dry mass production of leaves and underground plant parts
- Leaf number and leaf area were higher to the plants treated with complete solution

*Meliconia psitacorum*

# Visual symptoms



- S omission: presented little evident and uniform chlorosis in younger leaves
- No difference: shooting and leaves and roots dry mass production
- plants presented higher leaf number and leaf area

*Heliconia psittacorum*



# Conclusion

- 1. Macronutrients omission, except Ca, causes changes that are translated as visible symptoms of nutritional deficiency to each nutrient.
- 2. Among the macronutrients, N and P deficiencies affect more intensely shoot number, leaf dry mass production, total leaf number and area.
- 3. More evident symptoms of nutritional deficiency are conditioned to a highest time growing under nutrient omission conditions.
- 4. others rhizomes must be investigated

*Heliconia psittacorum*



A close-up photograph of a Heliconia 'Golden Torch' flower. The petals are a vibrant, fiery orange-red color, transitioning to bright yellow at the tips. The background is a soft, out-of-focus light grey and white. The text is overlaid in the center of the image.

**Postharvest Heliconia 'Golden Torch' under macronutrients deficiency**

# Objective:

- Evaluate *Heliconia* 'Golden Torch' flower stem characteristics and postharvest longevity, when submitted to macronutrients omissions.

*Heliconia psittacorum*

# Material e methods

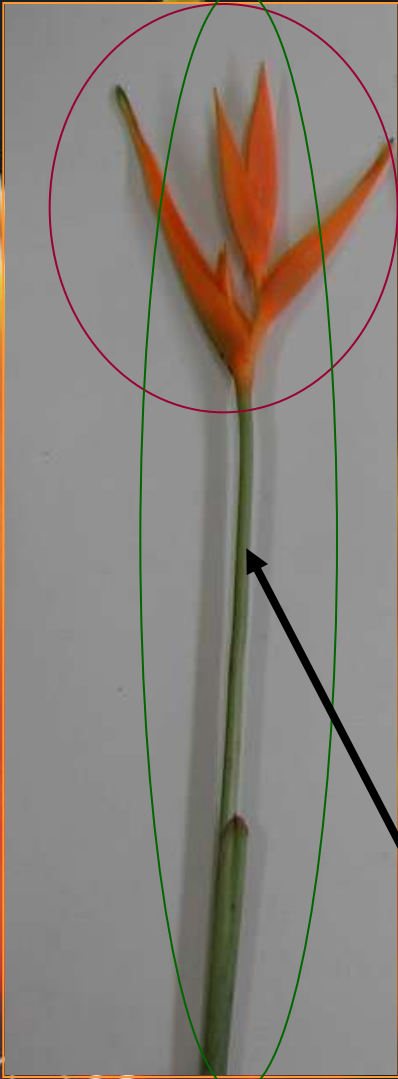
FLORICULTU  
TROPIC



- NPER: shoot n° ;
- NDEI: days to flowering;
- NDCI: days to harvest;
- CICLe: plant cicle, flower emittion to harvest

*Heliconia psittacorum*

# Material e methods



- NFOL: leaf number;
- MSHF (g): floral dry mass;
- COMI (cm): inflorescence length, apex to end of color part
- COMH (cm): stem length,
- DIAH (mm): stem diameter - 20 cm below the inflorescence;

*Heliconia psittacorum*

- POSC: Durability
- Stems: in water renewed every 2 days.
- Note scale:
- 0: excellent (fresh);
- 1: good (glossy loss);
- 2: regular (dark beginning);
- 3: end (10% dark)



*Heliconia psittacorum*



# Results

- Inflorescence: pale yellow color and deformation (omission of N)
- Treatment with water no inflorescence
- N, P, K affects durability



-N



Água

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Tratamento	NPER	NDEI	NDCI	CICLO	MSHF	DIAH	COMH	COMI	POSC
Completa	9.40 a	165.2 e	19,4 a	184.6 c	4.31 a	6.46 abc	84,6 bc	17,8 b	16,8 a
- N	3.80 b	172,0 c	16,8 b	188.8 b	1.62 c	4.58 c	74,4 e	14.0 c	12,8 bc
- P	4.00 b	195.6 a	15,2 bc	210.8 a	3.55 abc	5.76 bc	76,5 d	15,8 bc	13,2 bc
- K	10.60 a	176.8 b	14,0 c	190.8 b	2.21 bc	4.64 c	66,4 f	14,7 c	12,0 c
- Ca	8.60 a	172.4 c	11,6 d	184,0 c	3.18 abc	6.91 ab	95,3 a	17,8 b	15,6 a
- Mg	9.40 a	165.8 e	15,4 bc	181.2 d	3.40 abc	8.27 a	86,1 b	20,4 a	14,8 ab
- S	10.80 a	169.2 d	16,8 b	186 c	3.98 ab	6.80 ab	82,8 c	17,7 b	16,4 a
H <sub>2</sub> O	2.20 b								
CV%	27,12	9,56	34,56	7,84	19,66	23,89	7,97	12,24	11,17

*Heliconia psitacorum*

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