

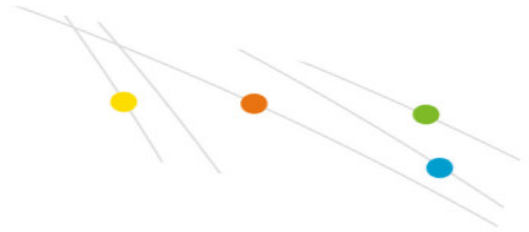
Increased rice net profit with 238 USD/ha by application with stage-specific Qrop® mix in Ecuador

Yield of rice was increased 12%, by the benefits delivered with potassium nitrate as main K source from Qrop® mix within a nutritional program, compared to a traditional program delivering the similar NPK amounts, but using on potassium chloride as main K source. This increase in yield more than compensated for the additional costs for the SQM treatment and increased profit for the producer with 238 USD/ha over the current management. 80% of the K_2O supplied in the traditional programme with potassium chloride (MOP) was replaced by potassium nitrate from the Qrop® mix. Also the amounts of other products within the traditional programme, like Urea and a relatively expensive source of Mg, Zn and Ca and S could be greatly reduced by application of Qrop® mix.

The average rice yield in Ecuador is quite low (approximately 4,5 MT/ha), and rice producers in Ecuador face several problems which affect productivity of their crop. Poor nutritional management is one of these. At present, the consumption of rice in the country is higher than its production. This is an incentive to support agronomic development to increase yields and be more competitive. Currently, rice producers base their fertilization mainly on nitrogen (100-140 kg N/ha) and use only very few units of potassium (30 kg K_2O /ha). The main source of K is potassium chloride (MOP) because of its low cost.

For development of the use of Qrop® mix in rice in Ecuador, results of trials with farmers aimed to show:

1. The benefits of use of potassium nitrate as main K source, as opposed to potassium



chloride,

2. The resulting yield-increase compensates the higher cost of Qrop[®] mix.

The canton Daule is located in Ecuador, in the coastal region of the province of Guayas. This province is source of more than half of Ecuador's total rice production. Daule is one of the main areas where rice is produced during the dry season, rice being the main commercial crop in the region. It is grown in paddy fields and sold by the producers to various rice-millers in the area.



Image 1. Harvest time of paddy rice field in the province of Guayas, canton Daule of Ecuador.

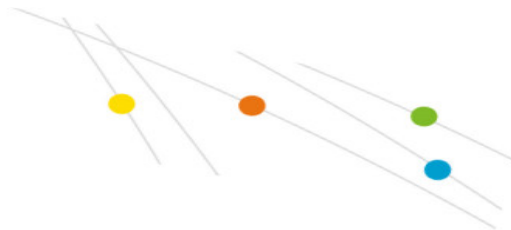
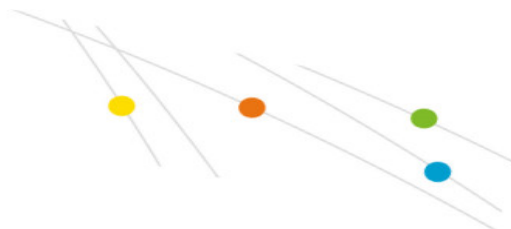


Image 2. Harvest time of paddy rice field in the province of Guayas, canton Duale of Ecuador.

The SQM agronomist team in Ecuador selected a group of progressive producers to cooperate in the development of the use of crop-stage specific Qrop[®] mix formulas. One of these was Ing. Jorge Estrada. Investigations with these producers led to the conclusion that not the amount of potassium supplied to the crop but the source of potassium applied was the limiting factor, resulting in low yields. The SQM team proposed to replace the major part (80%) of K_2O supplied with potassium chloride (MOP) by potassium nitrate from Qrop[®] mix, and slightly increasing the total K dose from 105 to 115 kg K_2O . The total application N and P remained the same - with Qrop[®] mix replacing 66% of N traditionally applied with urea and ammonium sulphate - and reducing the amount of an expensive source of MgO (4%), Zn (1,6%), CaO (22%) and S (8%) by 50% (Table 1). Both fertilizer programmes were compared on a large field of 24,6 ha. The control treatment with the client's current programme covered 22,4 ha and the SQM programme covered 2,6 ha. The SQM programme included two stage-specific Qrop[®] mix formula's: Qrop[®] mix Desarrollo (28-0-12) and Qrop[®] mix



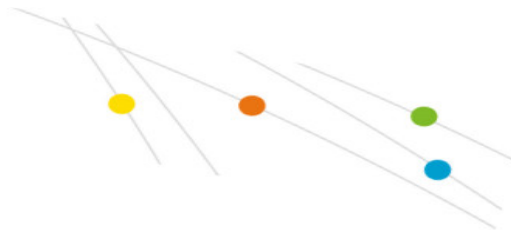
Producción (17-0-35).

Table 1. Fertilisers applied in the SQM programme including Qrop[®] mix and the current farmers practice.

Days after transplant (DAT) Días después del trasplante (DDT)	Fertiliser source Fuente del fertilizante	Qrop [®] mix programme Qrop [®] mix programa (kg/ha)				Farmers practice Práctica del agricultor (kg/ha)			
15 August/Agosto 15 DAT/DDT	DAP	70				70			
	Ca and a source of Mg Ca y una fuente de Mg	70				70			
	MOP	35				35			
	UREA	70				70			
	Total	245				245			
30 August/Agosto 30 DAT/DDT	Qrop [®] mix Desarrollo (28-0-12)	200				-			
	MOP	-				70			
	Ca and a source of Mg Ca y una fuente de Mg	-				70			
	UREA	-				35			
	Total	200				175			
15 September/Septiembre 45 DAT/DDT	Qrop [®] mix Producción (17-0-35)	200				-			
	MOP	-				70			
	UREA	-				105			
	Total	200				175			
30 September/Septiembre 60 DAT / DDT	Ammonium Sulphate Sulfato de Amonio	-				105			
	Total	-				105			
Total fertilisers / Total de fertilizantes (kg/ha)		645				700			
Total nutrients / Total de nutrientes (kg/ha)		N	P ₂ O ₅	K ₂ O	Cl	N	P ₂ O ₅	K ₂ O	Cl
		135	32	115	16	131	32	105	79
		S	MgO	CaO	Zn	S	MgO	CaO	Zn
		6	3	15	1	36	6	31	2
		N Tot	N NO ₃	N NH ₂	N NH ₄	N Tot	N NO ₃	N NH ₂	N NH ₄
		135	27	95	13	131	0	96	35

Result highlights

To establish the profitability of the application with Qrop[®] mix in the trial, an economic analysis was carried out (Table 2). The trial showed an increase of yield in favor of the SQM programme: Compared to the client's current practice, 12% more paddy rice compared was h



translated into an additional gross profit of USD 238/ha. This clearly showed that Qrop[®] mix increased the net income of the producer over the current management, and more than compensated for the additional costs incurred in the SQM treatment.

Table 2. Financial results for the farmer. The farmer received 322 USD/MT paddy rice.

	SQM programme with Qrop [®] mix Programa de SQM con Qrop [®] mix	Current farmers practice Practica actual del agricultor	Benefit from Qrop [®] mix Beneficios de usar Qrop [®] mix
Yield / Rendimiento (MT/ha)	9,4	8,4	1 (12%)
Revenue / Ingresos (USD/ha)	3027	2705	322 (12%)
Total cost* / Costos totales (USD/ha)	1584	1500	-84 (-5,6%)
Profit / Ganancias (USD/ha)	1443	1205	238 (20%)
Margin / Margen (%)	47,7%	44,5%	3,2%
Break even point: Yield increase required to justify investment in Qrop [®] mix Punto de equilibrio: se requiere del rendimiento para justificar la inversión and Qrop [®] mix			
+0,26 MT/ha (3%) +0,26 TM/ha (3%)			



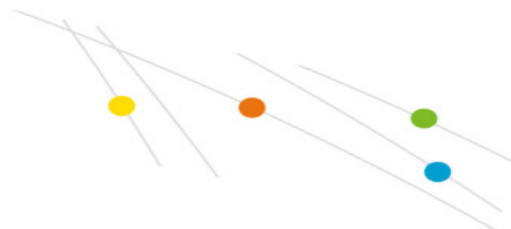


Image 3. Crop stand at the time of the first application of Qrop[®] mix, 30 days after transplant.