



**PRODUCT INFO
& DATASHEET**

COMPARATIVE TESTS

***The results of assessment of slow release fertilisers
SICOMIX SRF NPK 10.3-16.4-6.6 + 5.4 MgO and
SICOMIX SRF Fortissimo NPK 18-17.9-10.8 +9.2 MgO***
7/2015

SICOMIX® SRF (N-10.3%; P₂O₅-16.4%; K₂O-6.3%; MgO-5.0%), and SICOMIX® SRF FORTISSIMO (N -17,5%; P₂O₅-17,5%; K₂O-10,5%; MgO-9,0%) are the Slow Release Fertilisers (SRF) constructed on the principle of magnesium-potassium phosphate and urea-formaldehyde condensates (Ureaform). They are the stock fertilisers containing in part water soluble nutrients while the remaining ones are available in slowly soluble forms. Fertilisers are produced in tablets weighing 5, 10 or 15 g respectively.

Results of the measurement

Typical chemical analysis – total content of the nutrients in % (total amount):

Name	N	P ₂ O ₅	K ₂ O	MgO
SICOMIX® SRF	10.5	16.4	6.6	5.4
SICOMIX® SRF FORTISSIMO	18.0	17.9	10.8	9.2

Weight fluctuation in 5 g tablets: 5 +/- 0.2 g and in 10 g tablets: 10 +/- 0.16g. Strength of tablets: 310 N. Analytical determination of cold water insoluble nitrogen (WIN) and the hot water insoluble nitrogen (HWIN) contained in the fertilisers revealed below given Activity indexes (AI):

Name	N
SICOMIX® SRF	52
SICOMIX® SRF FORTISSIMO	50

Lysimetric test

The measurement of the rate of nutrients releasing from the fertilizing tablets was carried out on laboratory lysimeters by pouring distilled water (conductivity < 4 mS) over the tablets in time intervals.

Table 1. Comparative Agricultural- Fast Release Fertilisers (FRF)

Nutrient	Chemical Compound	Fertiliser containing the compound
NITROGEN	NH ₄ NO ₃	Ammonium nitrate, NPK
	CO(NH ₂) ₂	Urea
PHOSPHORUS	Ca(H ₂ PO ₄) ₂	Superphosphates, NPK
	CaHPO ₄	Phosphates
POTASSIUM	KCl	Potassium salts, NPK
	K ₂ SO ₄	Potassium sulphate

Table 2. Dynamics of the Nutrients Release (%) According to the Source

(Initial Nutrient Content in Sample = 100 %)

NITROGEN				
Weeks	Ammonium nitrate NH ₄ NO ₃	Urea CO(NH ₂) ₂	SICOMIX® SRF	SICOMIX® SRF FORTISSIMO
4	96.8	68.2	20.5	20.3
8	100.0	90.2	22.4	22.1
12		95.3	23.9	23.5

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16	100.0	24.2	23.9
PHOSPHORUS			
Weeks	Monocalcium phosphate $\text{Ca}(\text{H}_2\text{PO}_4)_2$	Dicalcium phosphate CaHPO_4	SICOMIX® SRF SICOMIX® SRF FORTISSIMO
4	61.2	42.5	4.3 4.5
8	74.4	48.7	5.6 5.4
12	76.6	50.3	6.5 6.0
16	78.8	51.4	7.0 7.1

POTASSIUM				
Weeks	Potassium chloride KCl	Potassium sulphate K_2SO_4	SICOMIX® SRF	SICOMIX® SRF FORTISSIMO
4	64.2	27.2	24.3	24.8
8	75.3	46.1	29.5	28.7
12	79.5	52.9	31.4	32.5
16	86.7	57.4	36.4	36.4

MAGNESIUM				
Weeks	Kieserite	MgO	SICOMIX® SRF	SICOMIX® SRF FORTISSIMO
4	76.7	29.8	0.11	0.10
8	89.1	36.3	0.23	0.21
12	91.5	43.9	0.34	0.33
16	94.4	48.5	0.66	0.64

Model experiments

The model experiments were established under natural conditions with total precipitation 840 mm/year and with the mean yearly temperature of 5.4°C.

Procedure: a nylon bobbin net (0.6 mm mesh) was spread out onto the soil and on it tablets of SICOMIX® SRF and SICOMIX® SRF FORTISSIMO of known composition and weight were placed.

The average residues of the tablets were collected at intervals as shown in the Table 3 (1 sampling = 2 x 24 tablets) and the loss in weight and their nutrients content were determined.

Table 3. Loss in Weight and in the Nutrient Content as % of the Original Sample

Establishment of the experiment	Mass	N	P	K	Mg
May 1991	100	100	100	100	100
June 1991	6	25	18	19	8
Month of Sampling	Mass	N	P	K	Mg
July 1991	45	62	36	50	14
Sept. 1991	46	63	37	69	23
Oct. 1991	52	67	40	85	30

Assessment of results

The declared composition of the SICOMIX® and SICOMIX® FORTISSIMO fertilisers was confirmed by the analysis of the supplied samples, the fluctuation in weight is very small, which makes it possible to apply the products methodically. Mechanical strength of the tablets is adequate for the intended handling and application. The „slowness“ of releasing of the individual nutrients from the SICOMIX® and SICOMIX® FORTISSIMO fertilisers may



be commented upon as follows:

* **NITROGEN**

The content of water soluble nitrogen is 65 % of the total nitrogen content. The assessed value of the activity indexes (AI) – 52 or 50 respectively points out to a condensate of urea. In the lysimetric tests the release proceeded several times more slowly than from urea and ammonium nitrate and even slower than from Ureaform. In the model experiment the release of 52 % of the original amount of N was ascertained in the course of the vegetation period. The obtained results confirm that the source of nitrogen in SICOMIX® and SICOMIX® FORTISSIMO is a urea-formaldehyde condensate that releases nitrogen slowly.

* **PHOSPHORUS**

Of the total phosphorus content in SICOMIX® and SICOMIX® FORTISSIMO-52% is in the water soluble form. In the lysimetric experiment the releasing of phosphorus proved that its fixation in the tablets is higher by an order than in mono and dicalcium phosphate but lower by an order than in tricalcium phosphate. The degree of phosphorus release from the tablets as found in the model experiment was 40 %. The bonding of phosphorus in the tablets SICOMIX® and SICOMIX® FORTISSIMO was shown to be very strong and its releasing to be very slow.

* **POTASSIUM**

Of the total content of potassium in the fertilisers 74 % is in the water soluble form. In the lysimetric experiment the rate of potassium releasing from the tablets is lower particularly in comparison with potassium chloride or potassium sulphate respectively, but several times higher when compared with potassium feldspar. In the model experiment 85 % of K contained in the fertilisers was released during the vegetation period. The rate of potassium releasing is the highest among the nutrients contained in the fertilisers; in spite of that, however, it is markedly lower when compared with conventional potassium sources.

* **MAGNESIUM**

Only 36 % of total magnesium present in SICOMIX® and SICOMIX® FORTISSIMO is in the water soluble form. Very slow releasing could also be observed in the lysimetric experiment. The 30 % of magnesium released in the course of the vegetation period in the model experiment indicates that the rate of releasing of that nutrient is sufficient. Magnesium is the nutrient that is released from SICOMIX® and SICOMIX® FORTISSIMO most slowly.

CONCLUSION

The comparison experiments conducted with the sample of SICOMIX® and SICOMIX® FORTISSIMO and with the standard sources used for the nutrition of cultivated plants **proved explicitly the slow release of nutrients from the former**. By using these fertilisers preconditions are established **securing a higher degree of the nutrients recovery as well as reducing of their losses brought about by retrogradation and leaching into ground waters**. Therefore, SICOMIX SRF fertilisers are predetermined particularly for regions with rigorous demand on environmentally safe approach to plant nutrition.