VITUPROP

Mold Inhibitor

Vitusa Corp.

VITUPROP

- Vituprop is a broad spectrum fungistat, comprised of a scientifically balanced formula of organic acids and other mold inhibiting ingredients.

MODE OF ACTION

- Vituprop combines organic acids and other mold inhibiting ingredients in a specific combination that inhibits proliferation of a broad spectrum of molds in feed.

WHEN AND WHY TO USE VITUPROP

- In all feeds and grains above a moisture level of 10%
- In all feeds and grains that will be stored for extended periods of time
- In areas of constant high humidity (70%+) and high temperatures (70ºF+)
- In feed and grains stored in areas of previous contamination
- In feeds that will remain in feeders or bunks for extended periods of time
- In grains and in feed produced from grains harvested during extremely wet or extremely dry growing seasons

ADVANTAGES OF VITUPROP

- Available in both liquid and dry forms
- Can be used during any feed manufacturing
- Can be used in both grains and in feeds
- Is less corrosive than 99% propionic acid
- Does not require water for activation
- Available for on-farm addition
- Proven safe - all ingredients approved for use in animal feeds

BENEFITS OF VITUPROP

- Provides mold inhibition across a broad spectrum of molds
- Guards against breakdown of grain and feed nutrient composition
- Maintains longer lasting mold inhibition
- More effective than other commercial mold inhibitors

VITUPROP
PERFORMS IN UNIVERSITY TEST

The greatest elimination of mycotoxins can occur by reducing the growth of toxin producing molds. Techniques used to accomplish this are:

- Dry grains below 10 to 11% moisture
- Store grains in dry cool areas reducing favorable environment for mold growth
- Treat grains and complete feed with an effective mold inhibitor

Vituprop mold inhibitor from Vitusa Corp. has a long history as an effective product when used in grains and animal feeds. It is a special blend of propionic acid with other mold inhibiting ingredients providing equivalent mold inhibition when compared to 99% propionic acid. Some important features of Vituprop relating to effectiveness and favorable choice in feed milling applications are:

- Special chemistry combination
- Low corrosiveness
- Low pungent aroma compared to other mold inhibitor products
- Proven inhibition to molds

A university study was conducted comparing mold inhibition strengths of Vituprop NC to three other liquid commercial products. Also, 99% propionic acid was used as a positive control treatment.

The test used disc assay methodology in which each commercial mold inhibitor, 99% propionic acid and a negative control (no mold inhibitor) were placed in the center of a Petri plate containing special growth agar. The plates were seeded with the similar quantities of molds. Two disc assays were performed, one contained Asperpillus s. and the other Fusarium s. Ten plates per treatment per assay were used.

Using pipettes, 50 microliters of mold inhibitors and the 99% propionic acid were placed in the center of each plate. The plates were incubated for three days and the “zone of inhibition” measured. The zone-of-inhibition is the circular area around the center of the plate where no mold growth occurs. The extent of this area is measured and compared to other treatment levels for evaluation of inhibitory effectiveness. The larger the zone-of-inhibition, the more effective the mold inhibitor in controlling growth of the molds.

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VITUPROP
PERFORMS IN UNIVERSITY TEST

Vituprop was found to significantly decrease the growth of Aspergillus when compared with all other mold inhibitors. The ranking from greatest to least inhibition was 99% propionic acid, Vituprop, Mold Guard, Myco Curb and Luprosil NC.

It was found that the Fusarium species were more susceptible to all mold inhibitors than Aspergillus. In ranking products from greatest inhibition to least inhibition Vituprop, 99% propionic acid and Mold Guard significantly outperformed Myco Curb which outperformed Luprosil NC.

Table 1 shows the numeric averages and statistical analysis for each treatment.

ZONE OF INHIBITION

PRODUCT	ASPERGILLUS	FUSARIUM
Control	**0**	**0**
Vituprop	63.56a	65.50a
99% Propionic Acid	51.80b	66.00a
Mold Guard	48.70c	65.90a
Myco Curb	26.80d	47.40b
Luprosil NC	14.40e	26.20c

Different letters per column means significant (P<.05).

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VITUPROP COMPARES TO 99% PROPIONIC ACID AS EFFECTIVE MOLD INHIBITOR

Vituprop, a broad spectrum fungistat comprised of a scientifically balanced formula of organic acids and other mold inhibiting ingredients, performs as well or better than 99% propionic acid. Propionic acid is the standard in mold inhibitors for the feed industry, however, due to corrosiveness and handling problems, other commercial formulations of mold inhibitors are commonly used (Paster, 1979). Through the years Vituprop has been shown to be as effective or more effective than 99% propionic acid on inhibiting growth of Aspergillus, Fusarium and mixed mold cultures.

Some buffered propionic acid mold inhibitors are actually propionate salts in solution and are less effective mold inhibitors than 99% propionic acid. Paster (1979) showed that propionic acid is a more effective fungistat than calcium propionate. Propionates must have a high moisture environment to be effective. Tabib et al (1984) found that a buffered propionic acid product was more effective if used in pelleted feeds because pelleting reduced the mold counts that the product had to inhibit and the conditioner provided moisture to help activate the propionate. The addition of the propionate to a normal moisture mash diet was much less effective on mold inhibition.

Out of twenty-one studies analyzed, only four used propionic acid as a positive control, while two studies compared propionic acid to control. As discussed, Paster (1979) found that propionic acid outperformed calcium propionate. Dixon and Hamilton (1981) reported that propionic acid was more effective than other organic acids in inhibiting mold growth in corn meal containing 20% moisture. Dixon and Hamilton (1981) also stated that the buffered salt is less active as a mold inhibitor than the free acid form of fungistat and in 1985 he found that propionic acid slowed dietary fat loss due to mold in feeds at a greater rate than sorbic acid or Agrosil. Phelps et al (1992) reported better gains and reduced mortality when propionic acid was added to the diets of male poults.

TABLE 2
COMPARISONS OF "DISC ASSAY" ZONES OF INHIBITION OF VITUPROP VS 99% PROPIONIC ACID

ASPERGILLUS FLAVUS	**ZONE OF INHIBITION (cm)**							
Assay number	29	36	41	55	61	62	77	97
Control	NI	NI	NI	NI	NI	NI	NI	NI
99% Prop.	3.52	5.10	2.66	4.91	2.97	4.94	4.05	4.43
Vituprop	CI	CI	CI	CI	7.47	CI	CI	CI
FUSARIUM SPECIES	**ZONE OF INHIBITION (cm)**							
Assay number	29	36	41	53	59	66	77	97
Control	NI	NI	NI	NI	NI	NI	NI	NI
99% Prop.	5.95	6.90	5.59	7.00	5.58	6.33	5.94	6.10
Vituprop	CI	CI	CI	7.77	5.62	7.64	6.82	6.91
MIXED YEAST CULTURES	**ZONE OF INHIBITION (cm)**							
Assay Number	29	48	49					
Control	NI	NI	NI					
99% Prop.	2.52	2.20	2.47	NI=No inhibition				
Vituprop	2.60	2.13	2.34	CI= Complete Inhibition = 8.10cm				

TABLE 3
NUMBER OF HOURS TO REACH 10% CO_2 IN MIXED MOLD CULTURES FOR CONTROL, 99% PROPIONIC ACID AND VITUPROP

Assay#	34	41	43	44	54	85
TREATMENTS	**NUMBER OF HOURS TO 10% $C0_2$**					
Control	72	112	136	112	144	72
99% Prop.	120	136	160	144	232	112
Vituprop	136	144	160	144	232	112

VITUPROP OUTPERFORMS MYCO-CURB FOR INHIBITION OF ASPERGILLUS, FUSARIUM AND CANDIDA MOLDS

Vituprop, a broad spectrum fungistat, is a specific combination of organic acids and other mold inhibiting ingredients that provide premium inhibition of molds and yeast growth. In ongoing lab studies using disc assay testing, Vituprop continues to outperform other commercial mold inhibitors. This research compares Vituprop to Myco-Curb in disc assays of cultured Aspergillus Flavus, species of Fusarium and Candida albicans.

In several disc assay studies, Aspergillus flavus, species of Fusarium and Candida albicans were individually plated on culture plates so that there were five plates per organism per mold inhibitor for each assay. Five plates without mold inhibitor per organism per assay were also grown as a Control. Mold inhibitors were added to the center of each plate at the rate of fifty microliters. Plates were incubated at 24ºC for three days for organism growth. Diameters of zones of inhibition, areas of no organism growth, were measured.

For all studies there was no inhibition of organism growth in the Control plates. This shows that viable organisms were cultured in the culture plates.

Table 1 shows the results of Vituprop and Myco-Curb on the inhibition of Aspergillus flavus growth. The addition of Vituprop to the culture plates provided complete inhibition of Aspergillus in all assays. Myco-Curb, however, at the same usage rate had very limited inhibition of Aspergillus. Vituprop was much more effective than Myco-Curb at inhibiting Aspergillus growth.

The effects of adding either Vituprop or Myco-Curb on the zones of inhibition of growth of species of Fusarium are in Table 2. While Myco-Curb seems to be slightly more effective against Fusarium growth than Aspergillus, Vituprop again outperformed Myco-Curb on inhibiting Fusarium growth in all assays. Although Vituprop did not completely inhibit all growth of Fusarium as it did for Aspergillus, Vituprop did reduce the growth of Fusarium at a much greater rate than Myco-Curb.

Table 3 shows greater zones of inhibition of Candida albicans growth for Vituprop than for Myco-Curb. Vituprop provides greater protection against Candida, a pathogenic yeast, than does Myco-Curb.

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TABLE 1 - COMPARISONS OF INHIBITION OF ASPERGILLUS FLAVUS BY MYCO-CURB AND VITUPROP BY DISC ASSAY

DISC ASSAY	PRODUCT	ZONE OF INHIBITION (CM)
36	Vituprop	Complete Inhibition
	Myco-Curb	3.26
41	Vituprop	Complete Inhibition
	Myco-Curb	1.45
55	Vituprop	Complete Inhibition
	Myco-Curb	2.36
62	Vituprop	Complete Inhibition
	Myco-Curb	3.24
72	Vituprop	Complete Inhibition
	Myco-Curb	2.73
77	Vituprop	Complete Inhibition
	Myco-Curb	2.20

TABLE 2 - COMPARISON OF INHIBITION OF FUSARIUM SPECIES BY MYCO-CURB AND VITUPROP BY DISC ASSAY

DISC ASSAY	PRODUCT	ZONE OF INHIBITION (CM)
36	Vituprop	Complete Inhibition
	Myco-Curb	4.64
41	Vituprop	Complete Inhibition
	Myco-Curb	1.42
53	Vituprop	7.77
	Myco-Curb	5.58
59	Vituprop	5.62
	Myco-Curb	3.95
77	Vituprop	6.82
	Myco-Curb	3.61

TABLE 3 - COMPARISON OF INHIBITION OF CANDIDA ALBICANS BY MYCO-CURB AND VITUPOP BY DISC ASSAY

DISC ASSAY	PRODUCT	ZONE OF INHIBITION (CM)
130	Vituprop	7.98
	Myco-Curb	4.34
134	Vituprop	5.41
	Myco-Curb	3.17

VITUPROP OUTPERFORMS MOLD-ZAP ON INHIBITING MOLD GROWTH

Vituprop, a broad spectrum fungistat is a combination of organic acids and other mold inhibiting ingredients that has been proven to be extremely effective in inhibiting the growth of molds. Vituprop has been shown to be as effective as 99% propionic acid without the corrosiveness or pungency. In both disc assay testing and carbon dioxide (CO_2) assays, when comparing Vituprop to other commercial mold inhibitors, Vituprop has been proven more effective. This research compares Vituprop to Mold-Zap by both the disc assays and the CO_2 assay.

In three disc assays, two with Aspergillus Flavus and one with Fusarium species, molds were plated on culture plates so that there were five plates per mold inhibitor for each assay. Mold inhibitors were added to the center of each plate at the rate of fifty microliters. Plates were incubated at 24ºC for three days for mold growth. Diameters of zones of inhibition, areas of no mold growth, were measured and results shown in Table 1.

In the CO_2 assay, feed is divided into three samples; Control (no mold inhibitor added), Mold-Zap, and Vituprop. The feed samples for each treatment are treated with mold inhibitor or left untreated and then divided into three 200 gram samples and sealed in Erlenmeyer flasks and incubated over time at 29ºC. Carbon dioxide measurements are taken at eight hour intervals until CO_2 levels reach 10% at which time, the hours of incubation are recorded. Results are shown in Table 2.

In the disc assay studies, Vituprop outperformed Mold-Zap for inhibiting Aspergillus and Fusarium. Vituprop had zones of inhibition diameters that were two to three times greater than the zones of inhibition for Mold-Zap at similar addition rates. Vituprop addition completely inhibited growth of Aspergillus Flavus and greatly reduced growth of Fusarium. Mold-Zap was much less effective as a mold inhibitor.

In the CO_2 assay, at the same addition rate, Vituprop again inhibited mold growth for nearly twice as long as Mold-Zap. Mold-Zap was only slightly more effective than Control which contained no mold inhibitor.

Vituprop was proven to be the more effective mold inhibitor in both sets of studies. Other studies have also shown similar advantages for Vituprop when compared to other commercial mold inhibitors. The advantage of Vituprop's greater mold inhibiting ability is less mold growth once feeds and feed ingredients are treated. Vituprop provides the benefit of the greatest protection against the establishment and growth of mold in livestock teed.

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TABLE 1
THE EFFECTS OF MOLD INHIBITORS ON GROWTH OF ASPERGILLUS FLAVUS AND FUSARIUM SPECIES

	PRODUCTS	**MOLD**	**ZONE OF INHIBITION (CM)**
Disc Assay #62	Vituprop Mold Zap 99% Propionic Acid	Aspergillus Flavus Aspergillus Flavus Aspergillus Flavus	Complete Inhibition 3.13 4.94
Disc Assay #66	Vituprop Mold Zap 99% Propionic Acid	Fusarium Species Fusarium Species Fusarium Species	7.64 3.90 6.33
Disc Assay #72	Vituprop Mold Zap	Aspergillus Flavus Aspergillus Flavus	Complete Inhibition 2.71

Complete Inhibition = 8.10 CM

TABLE 2
THE EFFECTS OF MOLD INHIBITORS ON MICROBIAL GROWTH AS MEASURED BY CO_2 PRODUCTION OVER TIME

CARBON DIOXIDE ASSAY #64 TREATMENTS

HOURS	CONTROL	**MOLD-ZAP** 250 ML/MT	**VITUPROP** 250 ML/MT
48 64 72 136	3.66 >10.0	 7.76 10.0	 6.56 10.0

COMPARISON OF VITUPROP AND OTHER MOLD INHIBITORS -CO_2 ASSAYS

Vituprop has been shown to be an excellent mold inhibitor. In the carbon dioxide (CO_2) assay, it has been shown to be at least as effective as 99% propionic acid against the variety of molds found in corn.

In a series of CO_2 assays, Vituprop was compared with various competitive products. Some of that data with Myco Curb and Luprosil is presented in this study.

In two studies, ground corn was used as the medium for mold growth. Moisture was raised to 20% to accelerate the assay, and the three mold inhibitors were applied at the dosage levels indicated. At 12 ounces per ton, Vituprop was equal to 16 ounces per ton of Myco Curb in one test (Table 1) and superior to that level in the second (Table 2). Vituprop at 12 ounces per ton was even more effective when compared with 16 ounces of Luprosil.

In the first study, greater concentrations of the mold inhibitors were compared at 20 oz. per ton, Vituprop was as effective as 28 ounces of Myco Curb and superior to Luprosil at 28 ounces per ton.

Clearly, it requires less Vituprop than either of these competitive products to attain a desired level of inhibition.

Generally, ground corn is used in our CO_2 assays because all corn contains some mold and with the increase in moisture level, good mold growth is generally seen in the assay. However, this is a mixture of many molds, and it is usually not possible to work with specific molds under these conditions.

Pelleted feed usually has a low mold count because the mold is killed during the pelleting process. In a third study, a pelleted pig feed was ground and innoculated with Aspergillus flavus. This was then used as the medium in a CO_2 assay. The mold inhibitors dosage levels and results appear in Table 3.

At half the dosage level, Vituprop was as effective as Myco Curb. The split numbers for these two products at 144 hours indicate that the two samples of each product, handled independently, did not reach the 10% carbon dioxide level (the end of the assay) at the same time. In the CO_2 assay, two samples of any product tested are each replicated three times. Therefore, most of these numbers represent an average of six observations. As might be expected, 99% propionic acid at half the dosage level was equivalent to 50% propionic acid.

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In disc assay tests, Vituprop has been shown to be more effective against Aspergillus flavus than 99% propionic acid. In this CO_2 assay with pelleted feed innoculated with Aspergillus flavus, Vituprop at the same dosage level was superior to 99% propionic acid in inhibiting growth, most of which could be attributed to that particular mold. Generally, Vituprop and 99% propionic acid are equally effective against the types of molds naturally found in feedstuffs like corn.

The results reported here indicate that based on two different mold evaluation methods, Vituprop is superior to Myco Curb and Luprosil.

TABLE 1

		VITUPROP		**MYCO CURB**		**LUPROSIL**	
HOURS	CONTROL	12OZ	20OZ	16OZ	28OZ	16OZ	28OZ
64	<10	6.68	2.93	6.93	3.12	8.85	4.96
72		9.15	3.36	9.48	3.72	>10	6.43
88		>10	7.95	>10	8.21		>10
96			>10		>10		

TABLE 2

		VITUPROP	**MYCO CURB**	**LUPROSIL**
HOURS	CONTROL	12OZ	16OZ	16OZ
72	3.81	0.79	1.06	1.42
88	>10	1.36	2.45	3.73
96		1.69	3.34	5.17
112		4.04	8.56	>10
120		5.60	>10	
136		>10		

TABLE 3

		VITUPROP	**MYCO CURB**	**PROPIONIC ACID**	
HOURS	CONTROL	8 OZ	16 OZ	60% 16 OZ	99% 8OZ
96	5.33	0.88	0.82	1.06	1.60
112	>10	1.42	1.60	2.17	2.19
120		1.75	1.93	3.17	6.95
136		6.30	6.98	>10	>10
144		>10-6.5	>10-8.22		
160		>10	>10		

Pelleted Feed innoculated with A. FIavus

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VITUPROP OUTPERFORMS MYCO-CURB AS MOLD INHIBITOR

Vituprop, a broad spectrum fungistat has been proven more effective than Myco-Curb at inhibiting Aspergillus, Fusarium and Candida albican in disc assay tests. When Vituprop and Myco-Curb are used at similar levels on cultured molds and yeast, Vituprop produced much greater zones of inhibition than Myco-Curb.

The carbon dioxide (CO_2) assay measures the ability of mold inhibitors to inhibit growth of various molds in feed over time. This research compares Vituprop to Myco-Curb in CO_2 assays.

In a CO_2 assay, feed is divided into three samples; Control (no mold inhibitor added), Myco-Curb, and Vituprop. The feed sample for each treatment is then treated with mold inhibitor or left untreated and then divided into three 200 gram samples and sealed in Erlenmeyer flasks and incubated over time at 29ºC. As molds grow, they convert oxygen into carbon dioxide. The more mold growth, the greater the CO_2 level. Carbon dioxide measurements are taken for each sample at eight hour intervals until levels reach 10% at which time the hours of incubation are recorded. Results are shown in Table 1.

Vituprop is a specialized blend of organic acids and other mold inhibiting ingredients that has been proven effective at inhibiting growth of mycotoxin producing molds and pathogenic yeast under various storage conditions and in a variety of feedstuffs.

The assay tests were designed to test Vituprop against Myco-Curb at equal, 75% and 50% levels of the Myco-Curb product. The table shows results that indicate Vituprop is more effective at equal usage rates. When Vituprop is used at one-half the rate of Myco-Curb it maintains the same effective mold inhibition ability.

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TABLE 1
THE EFFECTS OF MYCO-CURB AND VITUPROP ON MICROBIAL GROWTH AS MEASURED BY CO_2 PRODUCTION

Co_2 Assay Test Number	**Product**	**Usage Rate**	**# of Hour. to Reach 10% Co_2**	**% Increase of Effectiveness Over Mycocurb**
37	Vituprop	450 Ml/ton	136	21%
	Myco-curb	450 Ml/ton	112	
	Control		72	
54	Vituprop	450 Ml/ton	232	38%
	Myco-curb	450 Ml/ton	168	
	Control		144	
83	Vituprop	500 Ml/ton	168	23%
	Vituprop	375 Ml/ton	144	6%
	Myco-curb	500 Ml/ton	136	
	Control		88	
90	Vituprop	375 Ml/ton	136	13%
	Myco-curb	500 Ml/ton	120	
	Control		88	
44	Vituprop	250 Ml/ton	160	Equal
	Myco-curb	500 Ml/ton	160	
	Control		112	
41	Vituprop	225 Ml/ton	160	Equal
	Myco-curb	450 Ml/ton	160	
	Control		112	

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CORROSIVITY TEST
VITUPROP NC vs. LUPROSIL NC

From: Materials Technology Group
Engineering Division

Subject: Corrosion Test Results

Laboratory Technician: Tauscher, J.
Laboratory Notebook Ref.: LNX-18797-129
Document No.: CO2333

Chemicals involved in test: **Vituprop NC**

Description of test: Corrosion data for coupons tested in Luprosil NC for 336 hours at 90ºF
L=Liquid
V=Vapor

			Degree of Attack*				
Material	Mark	Corrosion Rate (MPY)**	Gen'l	Pitting	SCC	Temperature	Exposure Time
3003 ALUM	28L	0.2	A	A	A	90ºF	336
30030 ALUM	36V	0.2	A	A	A	90ºF	336
304 SS	8L	0.0	A	A	A	90ºF	336
304 SS	12V	0.0	A	A	A	90ºF	336
10-20 ST	11L	0.0	A	A	A	90ºF	336
10-20 ST	12V	0.0	A	A	A	90ºF	336

*A=Nil, B=Mild, C=Medium, D=Severe **ER YEAR (0.001 inches/year)

Subject: Corrosion Test Results

Laboratory Technician: Tauscher, J.
Laboratory Notebook Ref.: LNX-18797-131
Document No.: CO2335

Chemicals involved in test: **Luprosil NC**

Description of test: Corrosion data for coupons tested in Luprosil NC for 336 hours at 90ºF
L=Liquid
V=Vapor

			Degree of Attack*				
Material	Mark	Corrosion Rate (MPY)**	Gen'l	Pitting	SCC	Temperature	Exposure Time
3003 ALUM	28L	0.2	A	A	A	90ºF	336
30030 ALUM	36V	0.0	A	A	A	90ºF	336
304 SS	8L	0.0	A	A	A	90ºF	336
304 SS	12V	0.0	A	A	A	90ºF	336
10-20 ST	11L	0.0	A	A	A	90ºF	336
10-20 ST	12V	0.0	A	A	A	90ºF	336

*A=Nil, B=Mild, C=Medium, D=Severe **ER YEAR (0.001 inches/year)

Conclusion: Both products tested above are not corrosive to metals tested.

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VITUPROP DRY
PRODUCT INFORMATION SHEET

USE:
A dry mold inhibitor for direct application to feed and grain

	VITUPROP	**VITUPROP PLUS**	**VITUPROP AMMONIA**
INGREDIENTS:	Propionic Acid 50%	Propionic Acid 50% Gentian Violet 1.6%	Propionic Acid 50% Amm. Hydrox. 10%
CARRIER:	Vermiculite & Bentonites Max. 50%	Vermiculite & Bentonites Max 48.4%	Vermiculite & Bentonites Max. 40%

PHYSICAL CHARACTERISTICS:

Appearance	Small granules
Color	Brownish
Odor	Pungent
Density	38 - 40 Lbs. (17.2 - 18.1 kgs) per cubic ft.

APPLICATION: Apply _ kg of Vituprop per MT of feed

PRESENTATION: 25 kg net bags with aluminum liner

STORAGE: Store in cool, dry place away from excessive heat

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VITUPROP NC LIQUID
PRODUCT INFORMATION SHEET

Vituprop NC preserves all types of grains and feeds and is not caustic nor aggressive to conventional plastics. Vituprop NC is not corrosive to non-alloyed steel.

Vituprop NC can be applied directly to the feed or via injection system into the primary mixers. It can also be effectively applied to the vitamin and mineral premixes to be mixed with the final feed.

Vituprop NC guarantees a consistent distribution in the feed which is essential for effective treatment and preservation.

Usage Rate: **0.5-3.0 kgs per metric ton** depending on the moisture level and anticipated storage time of the feed.

Chemical Formula:	$CH_3CH_2CO_2NH_4$
Components:	Propionic Acid, Ammonium Hydroxide, Propyleneglycol
Specific Gravity	1.06
Stability	Min. 1 year
Density	8.94 lb/gal
Solubility	Soluble in water
Odor	Slightly aromatic
Flash Point	Non flammable
pH	6.8 - 7.0 Liq.
Vapor Pressure	0.188 psi @ 20ºc
Flash point	110ºc
Freezing Point	-30ºc
Appearance	Yellowish liquid

APPLICATION: Apply _ kg of Vituprop per MT of feed

PRESENTATION: 215 kg plastic drums

STORAGE: Store in cool, dry place away from excessive heat

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