The IR-4 Project's 2025
Industry Technology Session

Nematodes Control
Soil Fertility and Plant Health
with YSY® Yeast (*Papiliotrema terrestris* PT22AV)

Presenter: Bruno Folchi
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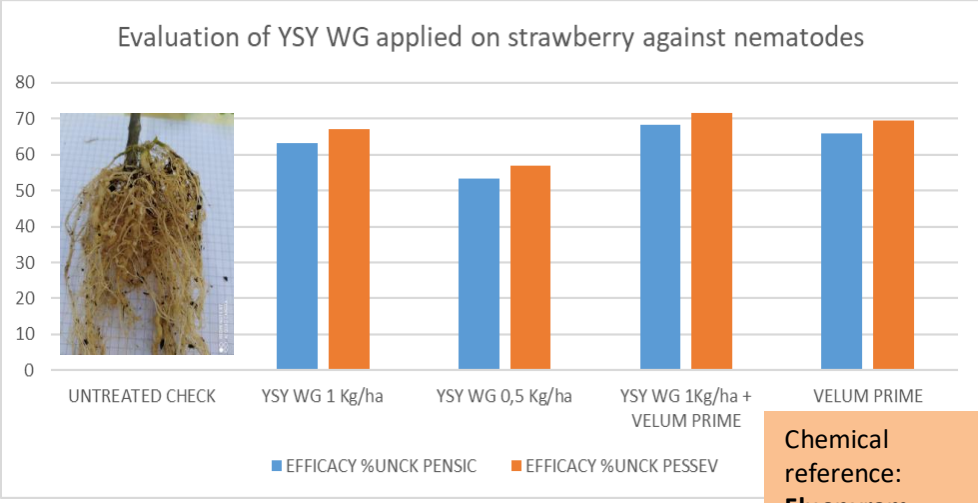
YSY® Yeast Nematodes Control (*Meloidogyne spp.*)
2024 IR-4 Industry Technology Session (reminder)

horticulturae MDPI

Article

Potential Role of the Yeast *Papiliotrema terrestris* Strain PT22AV in the Management of the Root-Knot Nematode *Meloidogyne incognita*

Trifone D'Addabbo [1,*], Silvia Landi [2], Davide Palmieri [3], Lea Piscitelli [4], Elena Caprio [5], Vincenzo Esposito [5] and Giada d'Errico [2]



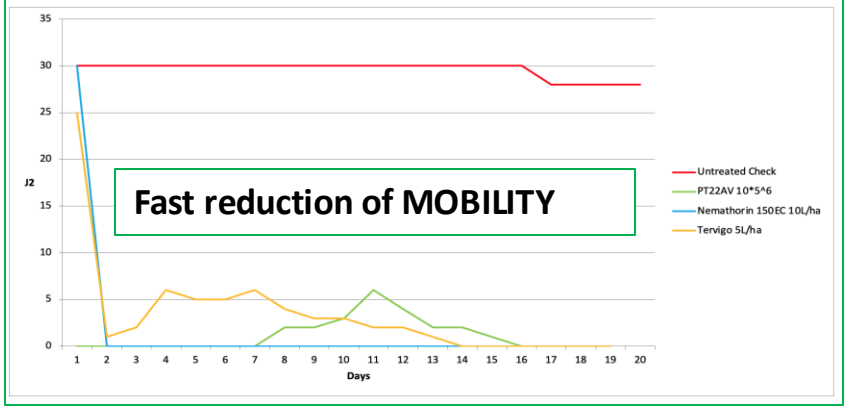
Chemical reference: **Fluopyram**

Up to 6 applications.

Pre transplant: 1 application 2-3 days by soaking seedling roots in solution of 1.5 g YSY Yeast / 1L water

Transplant till Fruit Ripening: every 14 days, drenching a mix of 1.0-1.5 Kg YSY Yeast / 6000-10000 L water / ha

Treatment	Time interval after transfer into H2O (days)																			
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
	N.° of immobile larvae turned out to be still alive																			
Untreated Check	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	28	28	28	28
PT22AV 10^5^6	-	-	0	0	0	0	0	0	0	2	2	3	6	4	2	2	1	0	0	0
Nemathorin 150EC 10L/ha	-	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tervigo 5L/ha	-	25	1	2	6	5	5	6	4	3	3	2	2	1	0	0	0	0	0	0



Larvae mobility after exposure (YSY low dose), vs fosthiazate (Nemathorin) and abamectine (Tervigo)

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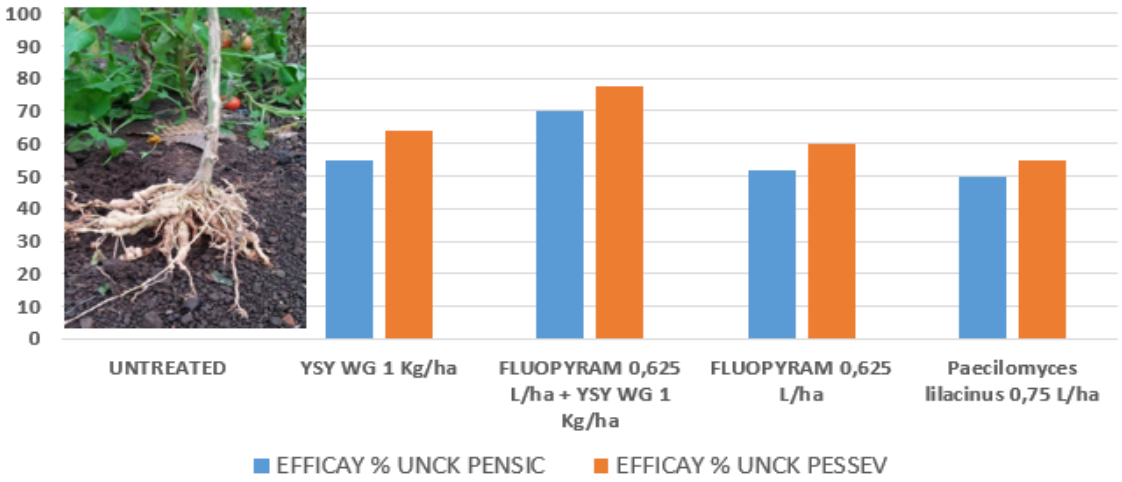
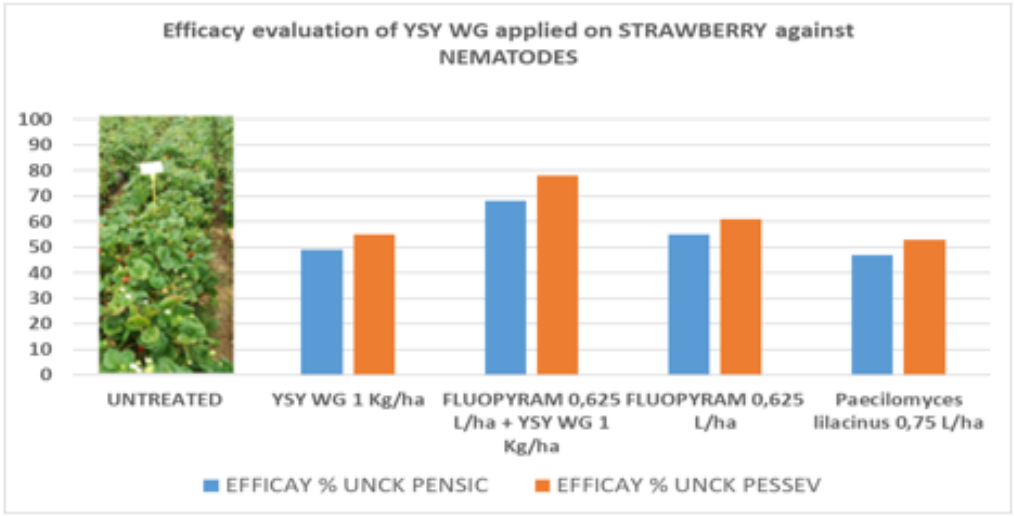
YSY® Yeast Nematodes Control (*Meloidogyne spp.*) 2024 Field Trials

Tomato: Average result from 8 trials in 2024 – Italy



Strawberry: Average result from 6 trials in 2024 – Italy



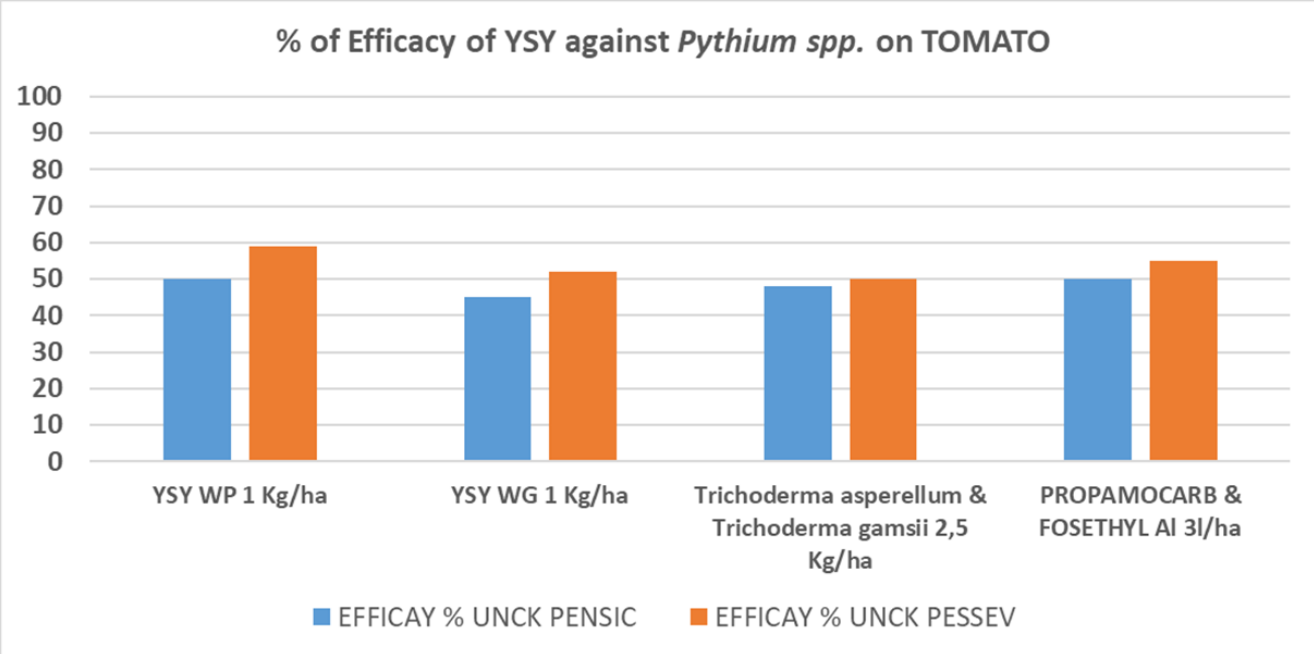
Field trial Protocol:
Up to 4 applications

Applications program:
Pre transplant:
1 application 2-3 days by soaking seedling roots in solution of 1.5 g YSY Yeast / 1L water
Transplant till Fruit Ripening: every 14 days, drenching a mix of 1.0-1.5 Kg YSY Yeast / 6000-10000 L water / ha

Fluopyram at 0.625 Kg/ha applied before transplanting followed by 4 applications of YSY WG at 1Kg/ha every 10-14 days, always provided excellent results in nematode control.

YSY® Yeast: Soil Borne Disease Control
Complementary Actions

Tomato: Average result from 6 trials in 2024 – Italy



Both formulations of YSY (WG and WP) guarantee efficacy results comparable to the chemical reference
Propamocarb & Fosethyl Al, and comparable efficacy to the biological standard based on *Trichoderma spp.*

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YSY® Yeast: BioConsortia Synergies?
Complementary Actions

Soil metagenomics 120 days after PT22AV application

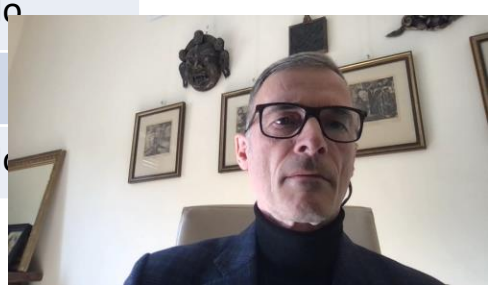
YSY® Yeast does not interfere with beneficial Nematode control microbiome

Soil type 2.3 TRT/CRT

TRT	CRT	% vs CRT	Significant
Papiliotrema terrestris			
4.56	1.00	456	Yes
Purpureocillium lilacinum			
28.26	35.94	78	No
Bacillus pumilus			
7.46	8.37	89	No
Bacillus firmus			
0.64	0.74	86	No
***Trichoderma* spp.**			
71.33	114.29	62	No

Soil type 2.4 TRT/CRT

TRT	CRT	% vs CRT	Significant
Papiliotrema terrestris			
4.73	0.83	569	Yes
Purpureocillium lilacinum			
6.41	6.96	92	No
Bacillus pumilus			
4.46	2.49	179	Yes
Bacillus firmus			
1.54	0.91	169	No
***Trichoderma* spp.**			
32.34	33.63	96	No



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YSY® Yeast: Bio Stimulation
Complementary Actions

Soil applications (Lettuce)

Treatments	Number of leaves	Dry weight of the root system (gr)	Dry weight of the arial part (gr)
Untreated check	12.6 (a)	3.32 (a)	1.47 (a)
PT22AV WP	18.75 (b)	4.45 (b)	2.25 (b)
PT22AV WG	19.7 (b)	4.62 (b)	2.2 (b)
Radifarm (*)	17.72 (b)	4.2 (b)	2.07 (b)

Consistent bio stimulation results from multiple trials on Tomato, Melon and other vegetable crops

(*) mix of vitamins, amino acids, proteins, saponins and mineral fraction

Seed Treatment (*Zea Mais* L)

Parameter	Percentage increase compared to control, after 7° days of seed emergence
Root increment	25%
Shoot length	12%
Leaf area	14%
Adventitious roots number	22%
Lateral roots number	4%
Root fresh mass	18%
Shoot fresh mass	16%
Root dry mass	2%
Shoot dry mass	23%

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YSY® Yeast: Abiotic Stress Mitigation Complementary Actions

plants

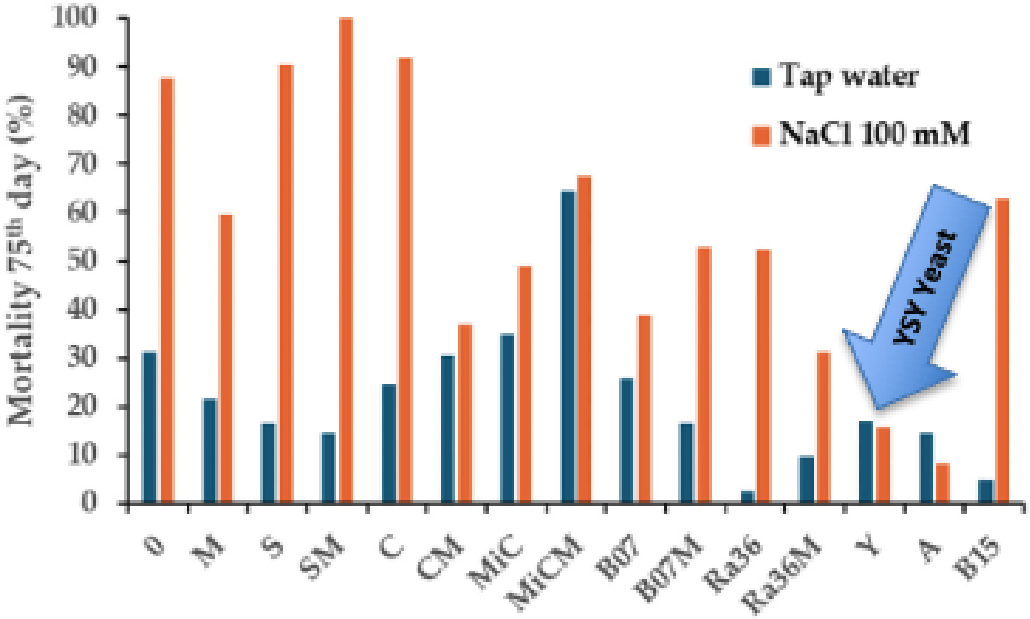
MDPI

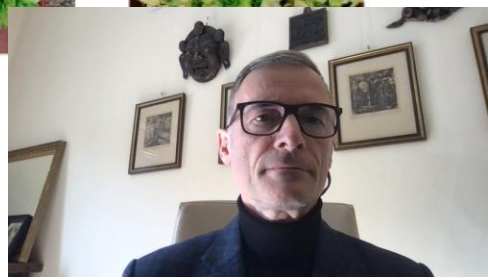
Article

Microbial Biocontrol Agents and Natural Products Act as Salt Stress Mitigators in *Lactuca sativa* L.

Claudio Caprari [1,*], Antonio Bucci [1], Anastasia C. Ciotola [1], Carmine Del Grosso [2,3], Ida Dell'Edera [1], Sabrina Di Bartolomeo [1], Danilo Di Pilla [1], Fabio Divino [1,4], Paola Fortini [1], Pamela Monaco [1], Davide Palmieri [2], Michele Petraroia [1], Luca Quaranta [1], Giuseppe Lima [2] and Giancarlo Ranalli [1]

Mortality cumulative incidence of lettuce plants on 75th days after exposure to saline stress (controls vs. treatments). Legend: 0 = control without treatments; M = molasses; S: soil; SM = S + M; C = compost; CM = C + M; MiC = micro compost mix; MiC = MiC + M; B07 = B. *amyloliquefaciens* strain B07; B07M = B07 + M; Ra36 = *R. aquatilis* strain 36; Ra36M = Ra36 + M; **Y = *P. terrestris* strain PT22AV**; A = Activeg; B15 = Bioalga 15.





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YSY® Yeast: LCA(*) : Life Cycle Analysis
Complementary Actions

		YSY use may reduce Fumigants impact by below multiples			
IMPACT CATEGORY	UNIT	1,3 Dichloro propene	Metam Sodium	Chloro picrine	Dimethyl bromide
Global warming	*kg CO2 eq*	79	320	163	254
Stratospheric ozone depletion	*kg CFC11 eq*	15	50	12,338	37
Ionizing radiation	*kBq Co-60 eq*	72	268	143	112
Ozone formation, Human health	*kg NOx eq*	87	361	76	213
Fine particulate matter formation	*kg PM2.5 eq*	90	1,735	73	249
Ozone formation, Terrestrial ecosyste	*kg NOx eq*	88	360	76	214
Terrestrial acidification	*kg SO2 eq*	51	1,510	43	166
Freshwater eutrophication	*kg P eq*	80	376	90	184
Marine eutrophication	*kg N eq*	3	132	4	6
Terrestrial ecotoxicity	*kg 1,4-DCB*	65	522	91	267
Freshwater ecotoxicity	*kg 1,4-DCB*	93	4,950	116	214
Marine ecotoxicity	*kg 1,4-DCB*	94	5,301	121	225
Human carcinogenic toxicity	*kg 1,4-DCB*	98	637	361	218
Human non-carcinogenic toxicity	*kg 1,4-DCB*	101	8,886	293	243
Mineral resource scarcity	*kg Cu eq*	92	1,667	118	214
Fossil resource scarcity	*kg oil eq*	151	403	114	355
Water consumption	*m3*	35	205	35	53

USE OF YSY YEAST AS AN ALTERNATIVE TO CHEMICAL FUMIGANTS
MAY SIGNIFICANTLY REDUCE ENVIROMNENTAL AND HEALTH IMPACTS

(*) Life cycle Analysis (LCA) is a methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service. Data alaborted with software SimaPro version 9.4.0.2. Database input: EcoInvent version 3.8. IMPACTS calculation method: ReCipe 2016 midpoint H. Methods used for calculations: ReCipe 2016 midpoint H (for impacts) and endpoint H (for damages to human health, ecosystems, natural resources)

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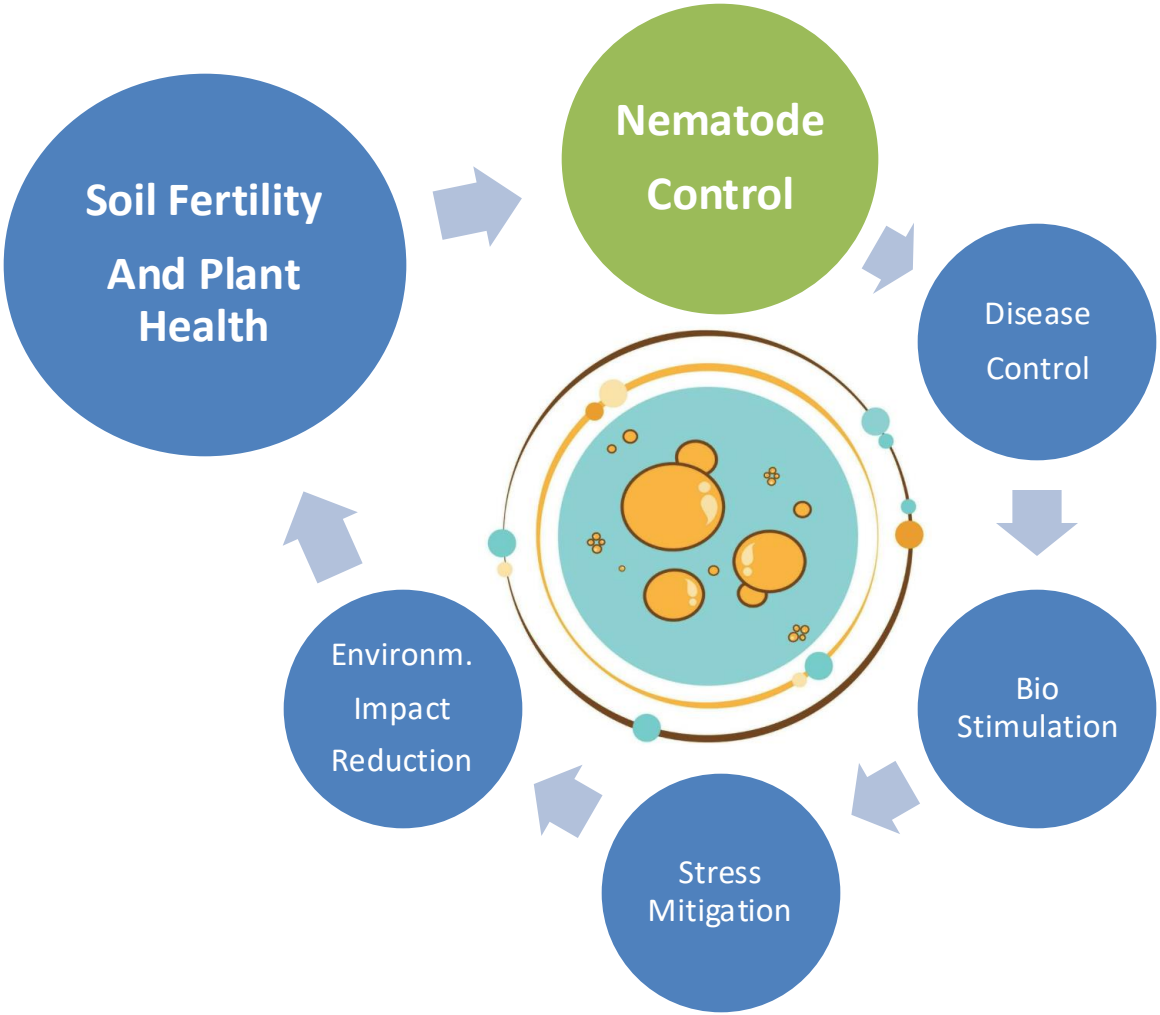
YSY ® Yeast Papiliotrema terrestris PT22AV
"Natural Intelligence"
for Nematodes Control, Soil and Plant Health



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YSY ® Yeast (Papiliotrema terrestris PT22AV) Further Info

- YSY® Yeast "*Papiliotrema terrestris* strain PT22AV" a Novelty Bio Control Agent developed by AgroVentures

  https://news.agropages.com/News/NewsDetail---49232.htm

- Youtube videos: AgroVentures channel.
  Interviews to University professors and R&D stations

  https://www.youtube.com/channel/UCAhedd3C62RPIX_AGynl_Qw

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