

Table: Summary of Datasets and Methods Used in Nematode Research

Title	Dataset name and URL	Dataset description	Methods	Accuracy	Pros	Cons	Citation
A Deep Learning-Based Decision Support Tool for Plant-Parasitic Nematode Management	Not publicly available; dataset self-collected.	415 images of RKN eggs; 1 class; 80% training, 20% validation.	YOLOv5, YOLOv6, YOLOv7	YOLOv5-640: Precision 0.992, Recall 0.959, F1=0.975, mAP@0.5=0.979	High precision, real-time inference, supports decision-making.	Dataset not public, limited to RKN eggs.	[1]
Machine Learning Algorithms Accurately Identify Free-Living Marine Nematode Species	https://zenodo.org/record/7275042	145 Leptolaimus, 260 Sabatieria; 40 species total.	RF, SCBoost, SVM, KNN	RF 93–100%, SVM 84–93%, KNN 97%	Automates identification, high accuracy.	Limited morphometrics, small dataset.	[2]
Microscopic Image Dataset of Plant-Parasitic Nematodes	https://data.mendeley.com/datasets/xck8yxj3xw/2	1,016 images, 11 classes, no predefined splits.	ResNet101V2, CoAtNet-0, EfficientNetV2B0/M	97.94% (EfficientNetV2B0/M + ResPro)	High resolution, publicly available.	Class imbalance, geographic limitation.	[3]
Valuation of Selected Methods in the Control of Plant-Parasitic Nematodes Infecting Carnation	Field Experiment (no dataset).	Soil and root samples; 8 treatments; 6 replicates.	Organic vs. Chemical control	Root galling reduction 53–69%	Eco-friendly, improves soil health.	Less effective than chemicals.	[4]
Plant Parasitic Nematode Management Using Antagonistic Plants as a Potential Substitute to Hazardous Chemicals	https://doi.org/10.1080/09670874.2024.2399069	Review of antagonistic plants: Tagetes, Crotalaria, Brassica, etc.	Review and synthesis	N/A	Eco-friendly, broad insight.	No quantitative data.	[5]
A Semi-Supervised Approach to Cluster Symptomatic and Asymptomatic Leaves in Root Lesion Nematode-Infected Walnut Trees	https://doi.org/10.1016/j.compag.2022.106761	Hyperspectral scans of 3 genotypes; control vs infected.	Semi-supervised clustering (SAM, N-FINDR, MDPA)	N/A	Detects asymptomatic infections.	Requires tuning per genotype.	[6]
Dataset on the Diversity of Plant-Parasitic Nematodes in Cultivated Olive Trees in Southern Spain	https://doi.org/10.1016/j.idb.2019.104658	376 soil samples; 128 species; 38 genera; 13 families.	Integrative taxonomy, beta diversity partitioning.	N/A	Extensive taxonomy coverage.	Not image-based.	[7]

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Advancements in Machine Vision and Deep Learning for Automated Nematode Cyst Identification in Agricultural Soil	Not publicly available.	10,000 high-resolution cyst images (nematode vs soil).	CNN (ResNet-50), Transformer, Traditional ML.	CNN 94.5%, Transformer 96.2%, Traditional 88.3%	Automated, scalable, real-time detection.	Dataset scarcity, GPU needed.	[8]

References

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- [4] J. W. Kimenju et al., "Evaluation of Selected Methods in the Control of Plant Parasitic Nematodes Infecting Carnation," *Journal of Agricultural Science*, vol. 6, no. 3, 2014.
- [5] Mushtaq et al., "Plant Parasitic Nematode Management Using Antagonistic Plants as a Potential Substitute to Hazardous Chemicals," *Int. J. Pest Manage.*, 2024.
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- [7] E. Archidona-Yuste et al., "Dataset on the Diversity of Plant-Parasitic Nematodes in Cultivated Olive Trees in Southern Spain," *Data in Brief*, vol. 27, 2019.
- [8] F. Oluwagbade, "Advancements in Machine Vision and Deep Learning for Automated Nematode Cyst Identification in Agricultural Soil," 2024.