

Winter Cover Crops in the Veneto Region: Two years of trials to evaluate the most effective species in this season

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Abstract

During the winters of 2003 and 2004, several cover crops were compared in the Veneto region by the Horticultural Experimental Center of Veneto Agricoltura 'Po di Tramontana,' Rosolina, Italy (60 km south of Venice). Field experiments were conducted in order to ascertain the most adaptable winter cover crop species in this region in terms of their production of organic matter, N-P-K and C content, and weed-controlling capability. The cover crops were tested in fields of 7000 m² each, situated in an organic area of 3.5 ha, with medium sandy soil (USDA classification) 70% sand, 18% silt, 12% clay, and 1.9% organic matter.

Respectively in 2003 and 2004, 11 and 18 different winter cover crops were hand sown into parcels of 147 m² and then harrowed. At blossom time samples of one m² were taken from each parcel, frozen and then analyzed for the content of dry matter and, only in 2004, the content of N-P-K and C.

In both years, the samples analyzed were limited to the epigeous part of the cover crop plants. Analysis of Variance for randomized blocks with Duncan test was done.

*In 2003, the sowing time was delayed from the ordinary seeding time by exceptionally high rainfall. In these conditions, the best productions of fresh and dry matter were given by the mixtures *V. villosa* + *S. cereale*, *V. villosa* + *A. sativa* + *P. sativum*, the mixtures of 11 species and *V. villosa* + *L. multiflorum* + *T. incarnatum*. The first three mixtures also had the best score in weed competition.*

*In 2004, the cover crops were sown one month earlier than in 2003, which corresponds to the ordinary sowing time in our region. The mixtures *L. multiflorum* + *F.**

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minor, *H. vulgare* + *V. sativa* and *S. cereale* + *V. sativa*, which had the highest content of fresh and dry matter. Where *T. incarnatum* and *S. cereale* were present either alone or in mixtures, the dry matter content was also high, even though the amounts of fresh matter were not among the highest. Despite the fact that *V. villosa* is considered to be more adaptable than *V. sativa* to the low temperatures of winter, the two combinations between *H. vulgare* or *S. cereale* with *V. villosa* were not as productive as the same two combinations with *V. sativa*. The percentage of weeds was low in every gramineae-leguminosae combination. Among the Brassicaceae family, the best performance in production and weed competition was given by *B. napus*. As for the N-P-K content again the gramineae-leguminosae combinations had the highest contents, particularly for *H. vulgare* + *V. sativa* and *S. cereale* + *V. sativa*.

In conclusion, for both years the best performances of productivity in term of fresh and dry matter, N-P-K content and weed-controlling capability, were given by a mixture of gramineae and leguminosae species; furthermore, the trial in 2004 showed that *V. sativa* is suitable to winter cultivation in our region and even more productive than *V. villosa*.