

Small-Scale Roller-Crimper for use with Walk-behind Tractors – Initial Tests

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Roller-crimpers have been used with success in organic production systems to terminate cover crop while retaining residue to suppress weed growth. However, most roller-crimpers on the market are relatively large and extremely heavy, relying on weight for enough pressure to effectively crimp and kill the cover crop. Thus, most roller-crimpers require a large tractor with significant horsepower to operate. Small-scale vegetable farmers seeking to reduce tillage are in need of new tools. This sheet presents anecdotal results and preliminary takeaways from the first year of trialing a walk-behind roller-crimper as part of the NC-SARE funded project “Building resilience to extreme rainfall events: Cover crop-based reduced tillage strategies for diversified organic vegetable farms.”

The roller crimper was designed by USDA-ARS Agricultural Engineer Dr. Ted Kornecki, along with other versions for use with small 4-wheel tractors. The crimper has a two-stage action, first rolling the cover crop down with a smooth drum, then crimping by the combined effect of weight and downward force from the rotating crimping drum transferred by adjustable springs. Trials showed a range of 84-100% termination rates for rye 14-21 days after crimping (Kornecki, 2015).

Dr. Kornecki provided guidance and advice on roller-crimper fabrication including a conversion kit for use with a Grillo G110 walk-behind tractor. Due to COVID-19 restrictions, we were not able to proceed with a full research trial, but in June 2020, we tested the roller-crimper on cover crops at West Madison Agricultural Research Station (WMARS) and at participating farm Circadian Organics in southwestern Wisconsin. Details of cover crops are below.

Overall, the crimper was simple to use and functioned well. Due to down-pressure from springs and the bounce of the crimping wheel providing part of the crimping effect in addition to weight, it was almost as successful in crimping rye as 15’ Rodale-style crimpers, based on project managers’ observations. See next page for photographs.



Figure 1: Rue Genger tests out the crimper on a stand of rye at West Madison Agricultural Research Station

Cover crop	Location	Planting rate	Planting date	Crimping date	Overall success
Rye	WMARS	3 bu/A	10/9/19	6/17/20	Good
Rye	Circadian Organics	4 bu/A	10/8/19	6/11/20	Good
Winter wheat	WMARS	150 lb/A	9/27/19	6/17/20	Good
Oats	WMARS	100 lb/A	4/2/20	6/17/20	Poor
Oats and field pea	Circadian Organics	150 lb/A	4/5/20	6/11/20	Poor



Figure 2: Winter wheat at WMARS successfully crimped and did not bounce back up



Figure 3: Rye at WMARS successfully crimped. While it did bounce back up a little, it successfully killed.



Figure 4: Oats at WMARS was not successfully crimped despite initial appearances.



Figure 5: Oat-pea mix at Circadian Organics did not crimp successfully. While it seemed to show a clear crimp, it had a poor kill rate.



Figure 6: One month after crimping about 50% of the oat and pea mix had survived.

On-farm research trials are planned for 2021. The roller-crimper will be compared to other cover crop termination methods for rye including occultation and tillage, followed by trials of pepper, cabbage and winter squash production.

To learn more and get involved:

- Join our email group by emailing CROVP+subscribe@googlegroups.com
- Contact Rue Genger (rkgenger@wisc.edu) or Claire Strader (claire@csacoalition.org)
- Visit our website by scanning the QR code or at <https://sites.google.com/view/climate-resilience-for-organic>



Reference cited: Kornecki, T.S. (2015). Rye Termination by Different Rollers/Crimpers Developed for No-Till Small-Scale Farms. *Appl. Eng. Agric.* 31, 849–856.



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